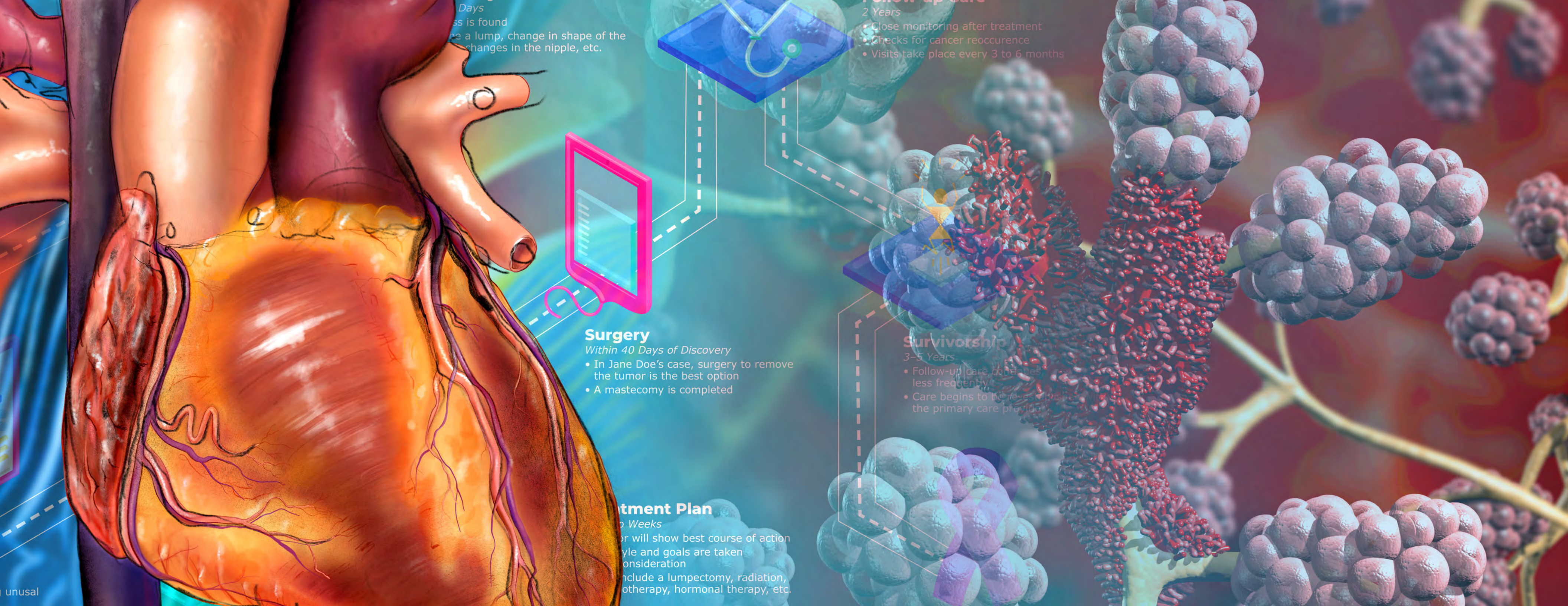




2019–2022 Biomedical Art and Visualization

ART • SCIENCE • MEDICINE • TECHNOLOGY | ROWAN UNIVERSITY



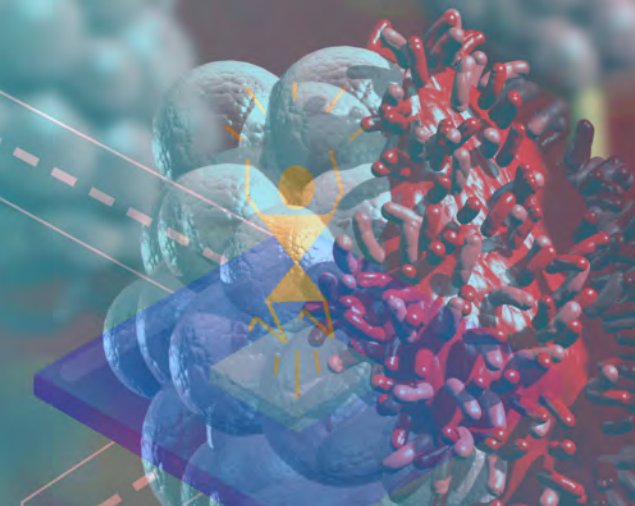
Discovery
Days
... is found
... a lump, change in shape of the
... changes in the nipple, etc.

Follow-up care
2 Years
• Close monitoring after treatment
• Checks for cancer reoccurrence
• Visits take place every 3 to 6 months



Surgery
Within 40 Days of Discovery
• In Jane Doe's case, surgery to remove the tumor is the best option
• A mastectomy is completed

Treatment Plan
10 Weeks
... or will show best course of action
... style and goals are taken
... consideration
... include a lumpectomy, radiation,
... otherapy, hormonal therapy, etc.



Survivorship
3-5 Years
• Follow-up care continues less frequently
• Care begins to be less intensive
• the primary care provider

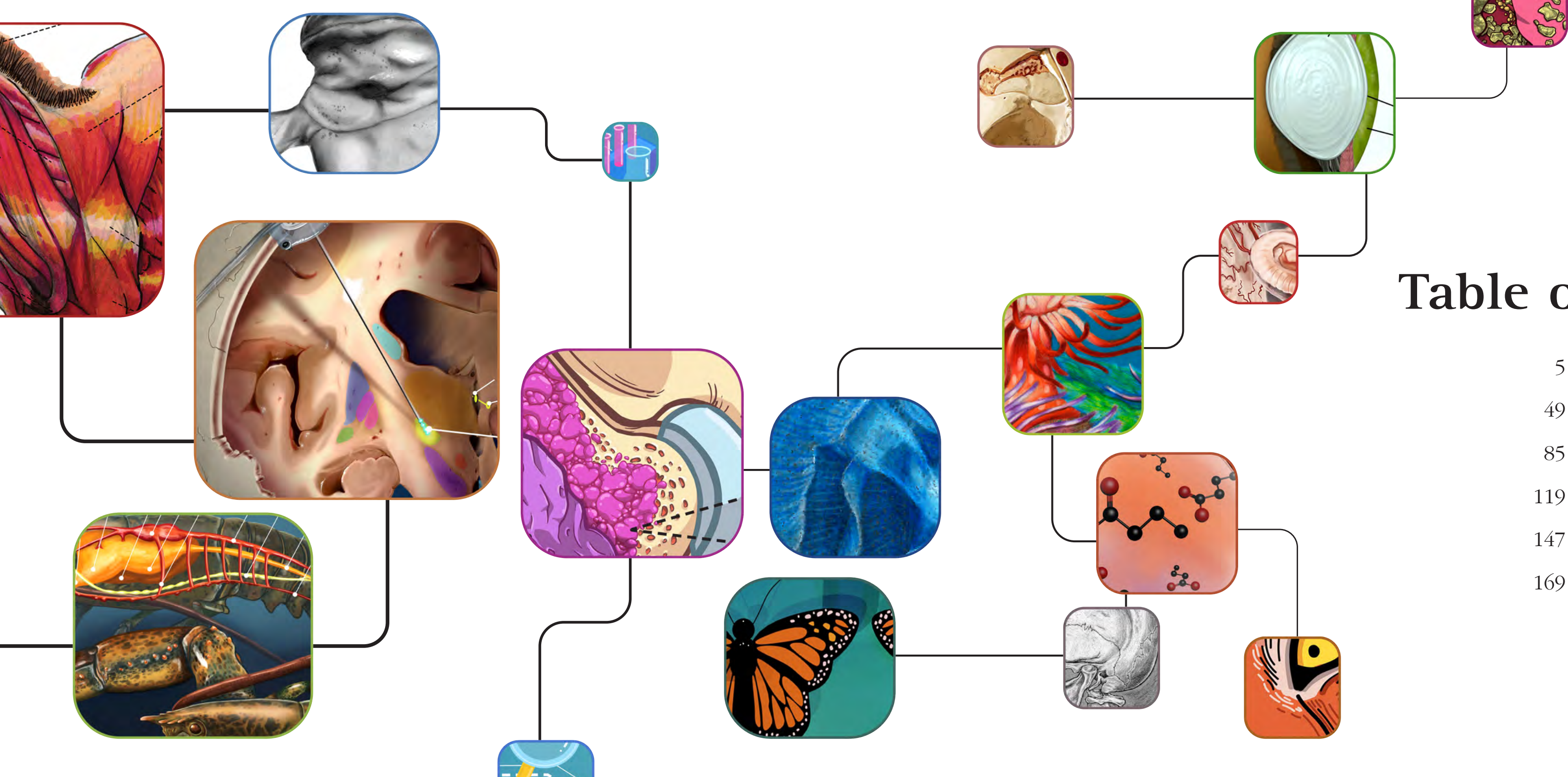
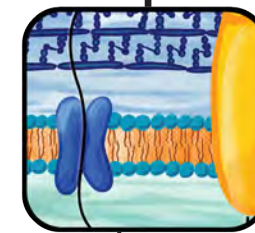
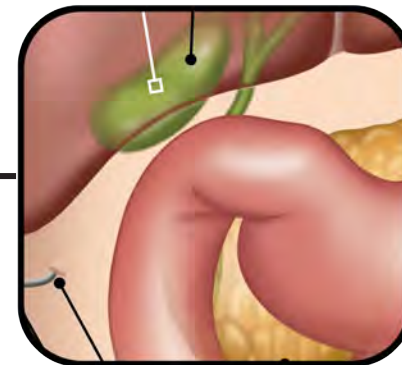
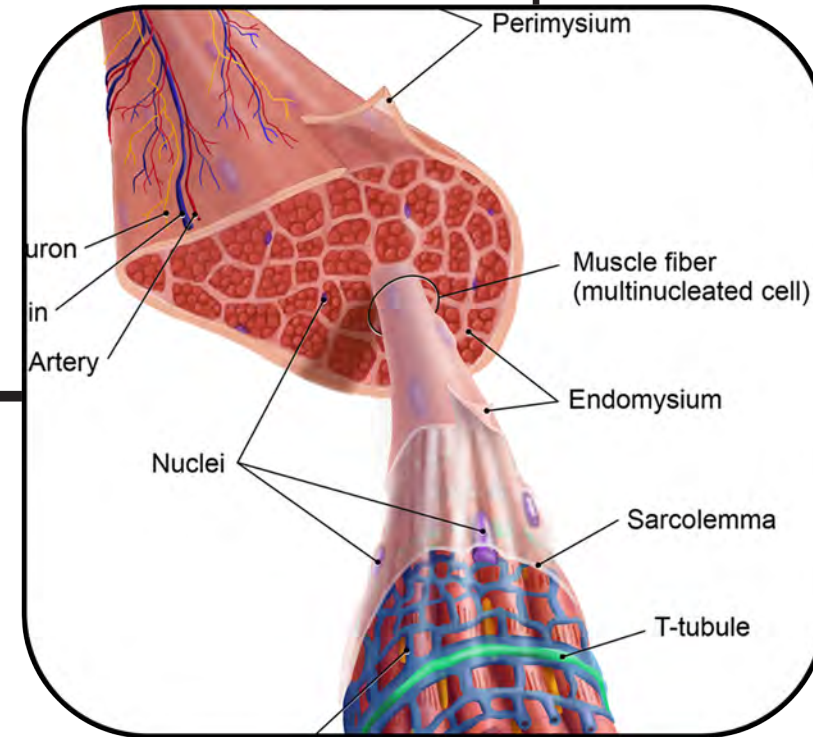


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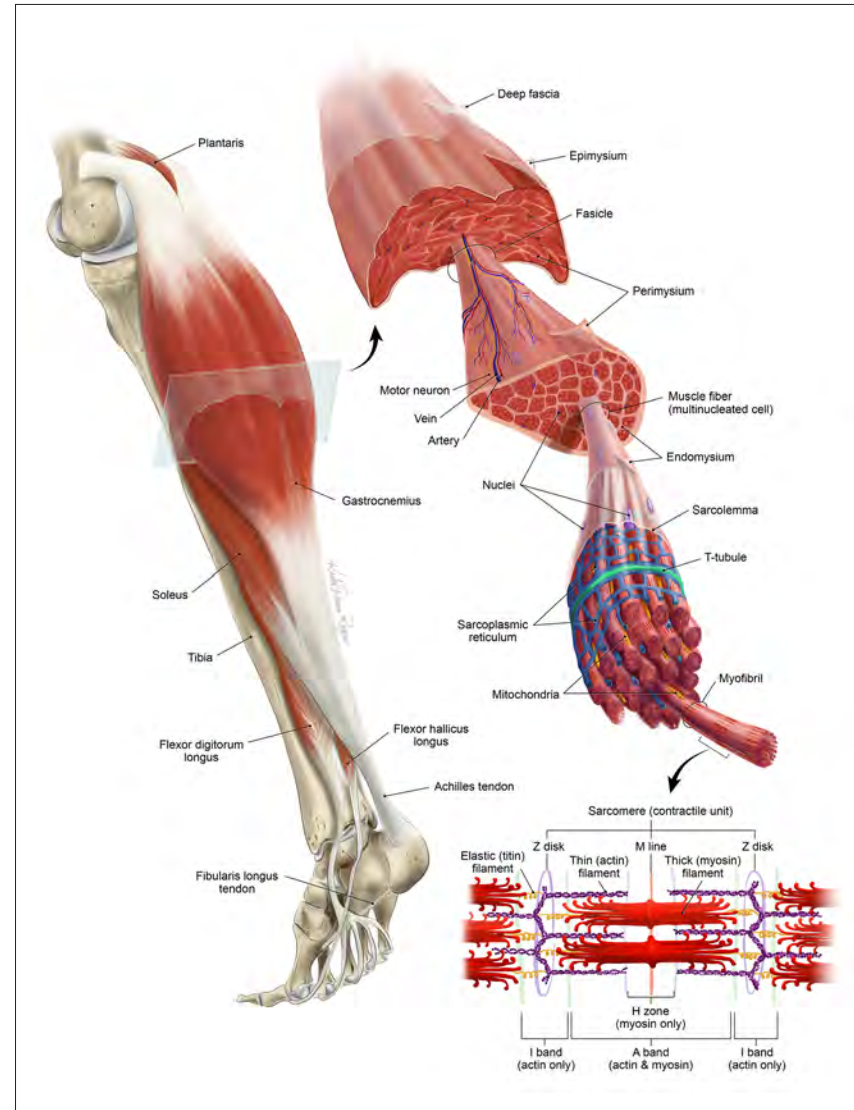
- 5 Medical Illustration
- 49 Scientific Illustration
- 85 Fine Art (of Science) Illustration
- 119 3D Visualization
- 147 Game Design
- 169 Information Design



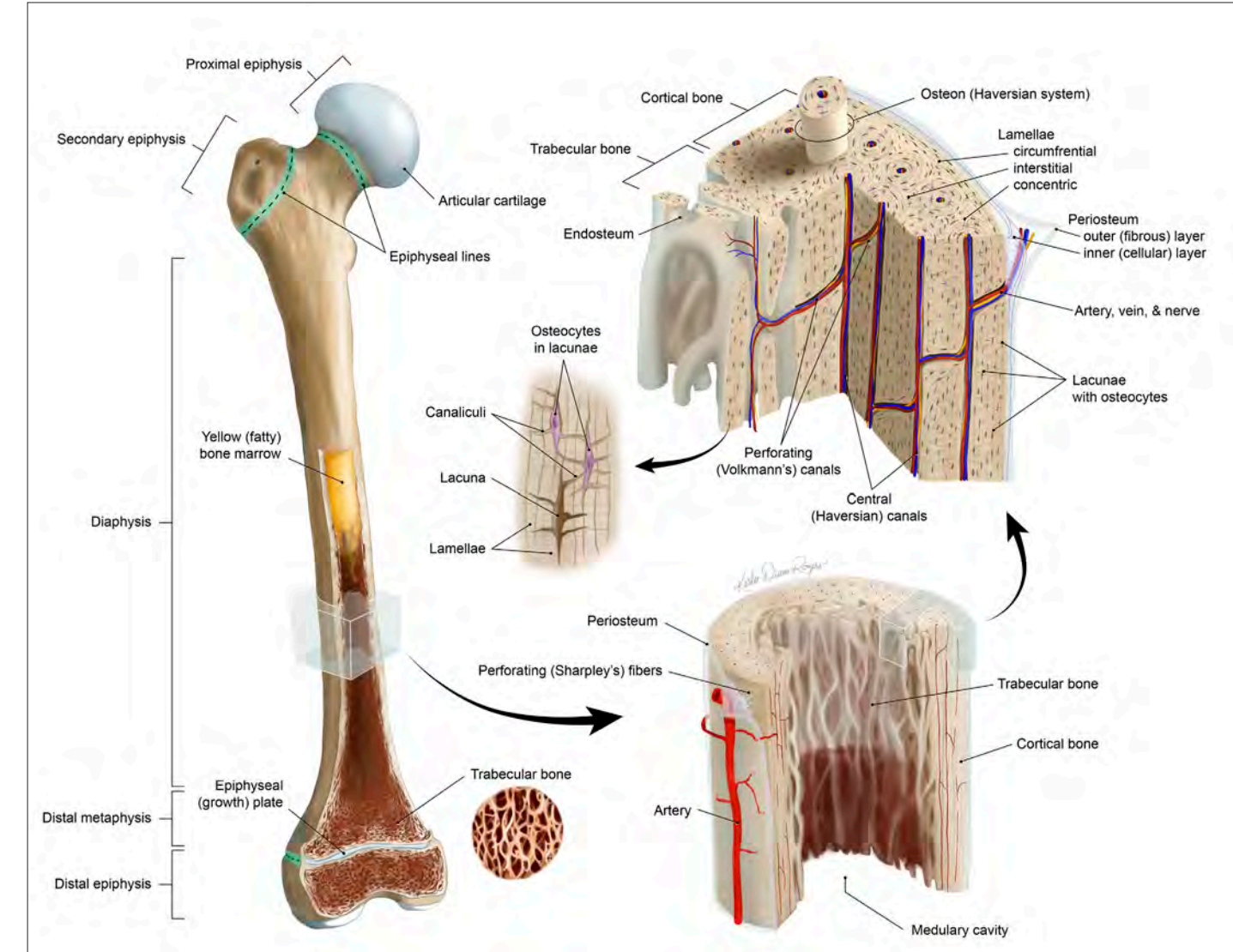
Medical Illustration

A medical illustrator is a visual problem solver. Background research, including reading scientific papers, meeting with scientific experts, perhaps observing surgery or a laboratory procedure, is often an integral part of the creative process.

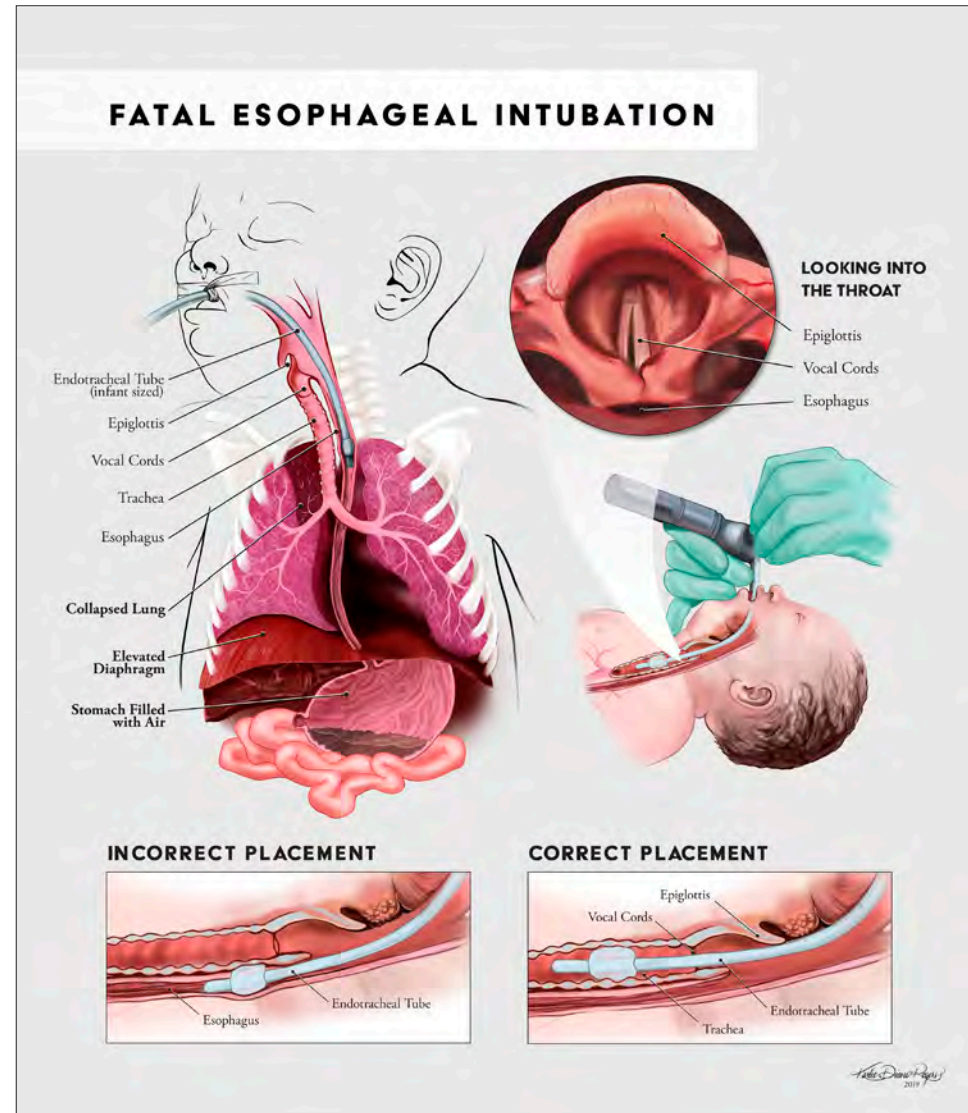
— Association of Medical Illustrators



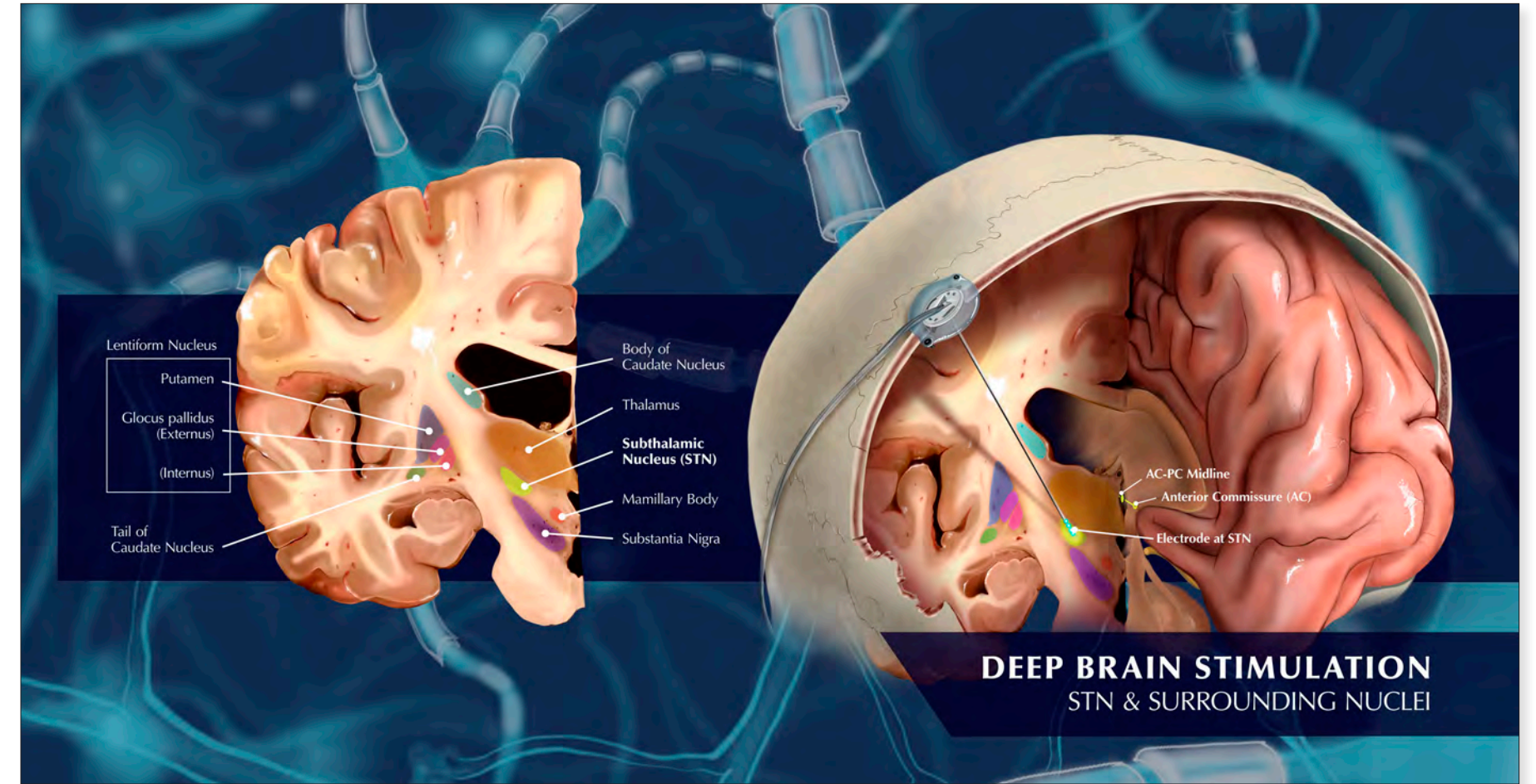
Skeletal Muscle Mechanism of Action
 Karlee D. Rogers 2020
 24" x 18" Digital Media



*Skeletal Bone Anatomy
 Gross/Macro View(s)*
 Karlee D. Rogers 2020
 24" x 18" Digital Media



Fatal Esophageal Intubation
Karlee D. Rogers 2019
36" x 24" Digital Media



Deep Brain Stimulation Anatomy
Karlee D. Rogers 2020
24" x 16" Digital Media

OSTEOARTHRITIS OF THE HIP

BREAKING DOWN BEYOND THE BONES

Osteoarthritis is associated with a number of comorbidities in older patients. Aging-related changes in joints at the cellular level create conditions conducive to the development of osteoarthritis. Additionally, chronic, low-grade inflammatory processes called "inflammaging" occur in all aging tissues. This can contribute to the development of osteoarthritis and its link to other chronic diseases. These factors collectively can cause pain and physical inactivity. Physical inactivity itself can contribute to the intertwined relationship between obesity and osteoarthritis.

Obesity
Obesity causes excessive body weight to be placed on joints, exacerbating the friction of cartilage/bones. The pain associated with osteoarthritis can cause an individual to limit their physical activity. This consequently worsens other chronic conditions such as diabetes, hypertension, and cardiovascular disease.

Diabetes
Similarly to how diabetes can be linked to obesity, cardiovascular disease can be correlated with diabetes. High blood glucose from diabetes can damage the blood vessels and nerves associated with the heart.

Hyperlipidemia
Hyperlipidemia (high cholesterol) is also linked with obesity and diabetes. Obesity raises triglycerides levels. Diabetes raises LDL (bad cholesterol) levels and lowers HDL (good cholesterol) levels. Hyperlipidemia can lead to hypertension (high blood pressure) and consequently cardiovascular complications.

Hypertension
When there is an excess amount of cholesterol in the bloodstream, cholesterol can collect around the artery walls and form plaque. This causes the arteries to become stiff and narrow, making blood difficult to travel throughout the body. In response, the heart pumps harder in an attempt to push blood through, driving blood pressure up.

Cardiovascular Disease
Continuous strain from hypertension can damage artery walls, making them more susceptible to plaque buildup. If blood blockage occurs by the brain or heart, it can lead to a stroke or heart attack respectively.

Depression
Pain, fatigue, disability, and potential social complications associated with osteoarthritis put individuals at a higher risk for depression.

Articular cartilage degeneration

Osteophytes

Symptoms

- Pain
- Joint Stiffness
- Tenderness
- Loss of Flexibility
- Grating Sensation
- Bone Spurs
- Swelling

Treatments

Osteoarthritis cannot be cured. However, it still can be treated.

- Weight management
- Pain management
- Physical therapy
- Medication
- Surgery

*Osteoarthritis of the Hip:
Breaking Down Beyond the Bone*
Terry Nguyen 2022
24" x 36" Digital Media

Total Hip Arthroplasty (THA)

Performed by Dr. Jack Shilling, MD
Cooper University Hospital
Illustrated by Karlee Rogers

- Orientation and incision for Direct Lateral approach
- Surgical field following joint dislocation
- Acetabular reaming
- Acetabular components
- Femoral head removal and marrow space rasping
- Femoral components
- Hip prosthesis in situ

Posterior dissected portion of the tensor fascia lata

Rectus femoris

Femoral head

Acetabular rim

Joint capsule

Anterior dissected portion of the tensor fascia lata

Gluteus minimus

Gluteus medius

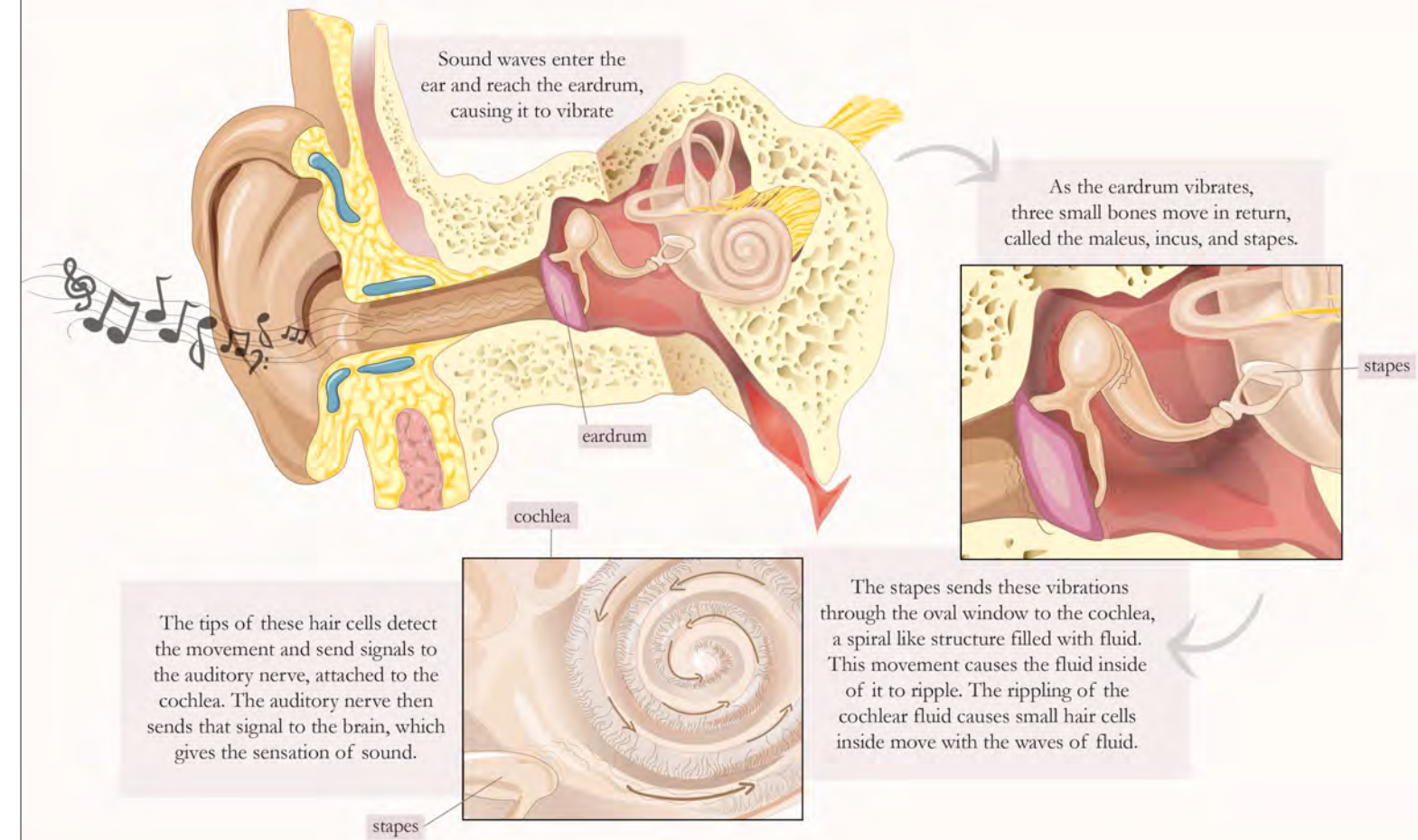
Greater trochanter

Vastus lateralis

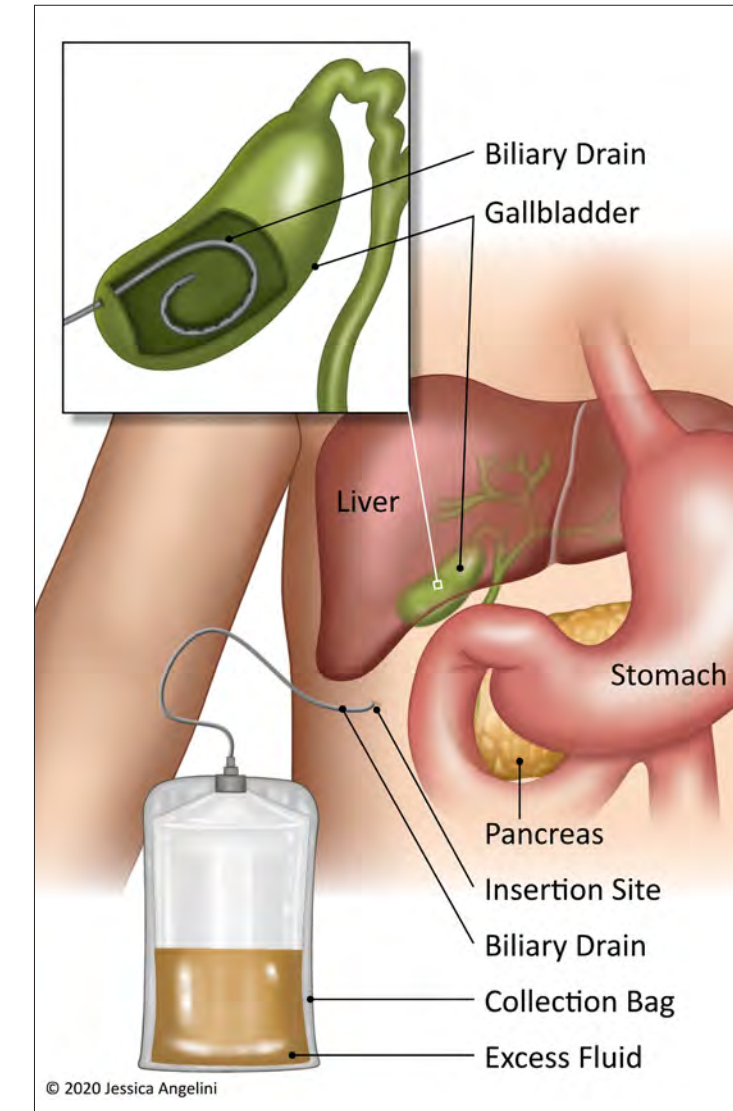
Cooper University Hospital

Total Hip Arthroplasty Procedure
Karlee D. Rogers 2019
12" x 9" Digital Media

How Do We Hear?



Ear Anatomy: How Do We Hear?
Veronica Cava 2020
12" x 10" Digital Media



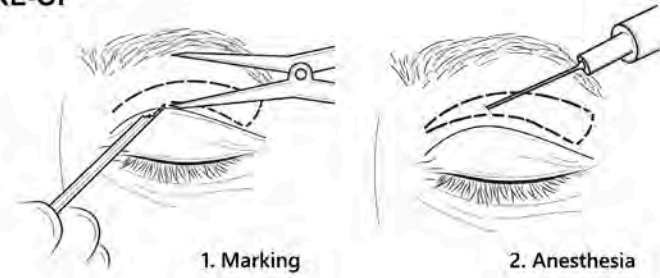
Oncolink: Biliary Drain Placement
Jessica Angelini 2021
12" x 10" Digital Media

UPPER BLEPHAROPLASTY

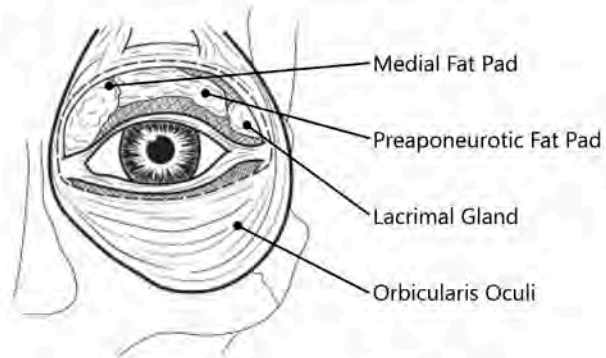
Dr. Thomas McClellan

Upper Blepharoplasty is a corrective surgery to address dermatochalasis of the upper eyelid. Dermatochalasis usually occurs with aging but can also develop at a younger age due to genetics. Patients may choose this procedure due to the feeling of heavy eyelids, impaired vision, or cosmetic reason.

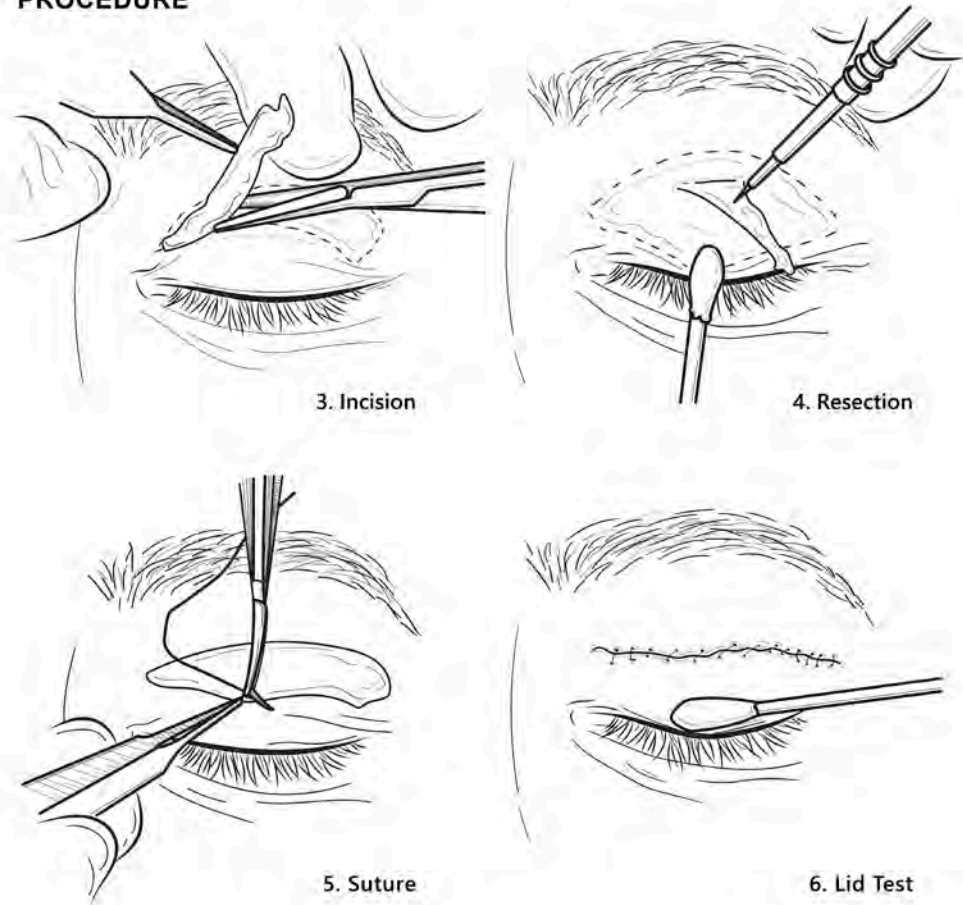
PRE-OP



ORIENTATION



PROCEDURE

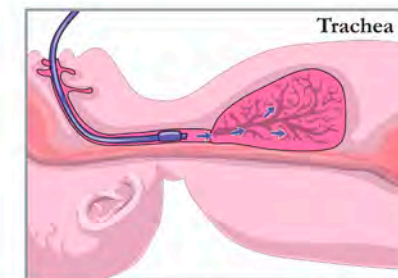
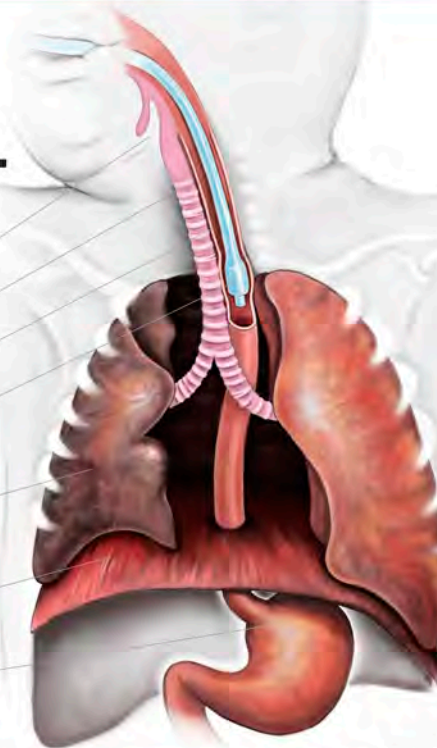


© 2020 Jessica Angelini

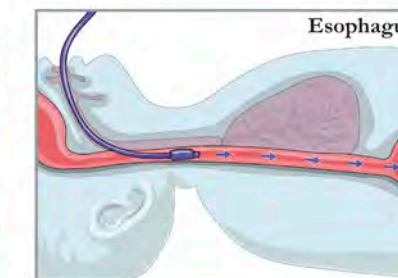
ESOPHAGEAL INTUBATION

Fatal Misplacement of the Endotracheal Tube in an Infant

- Epiglottis
- Trachea
- Esophagus
- Incorrectly Placed Endotracheal Tube
- Collapsed Right Lung
- Raised Diaphragm
- Stomach Filled with Air



correct endotracheal intubation

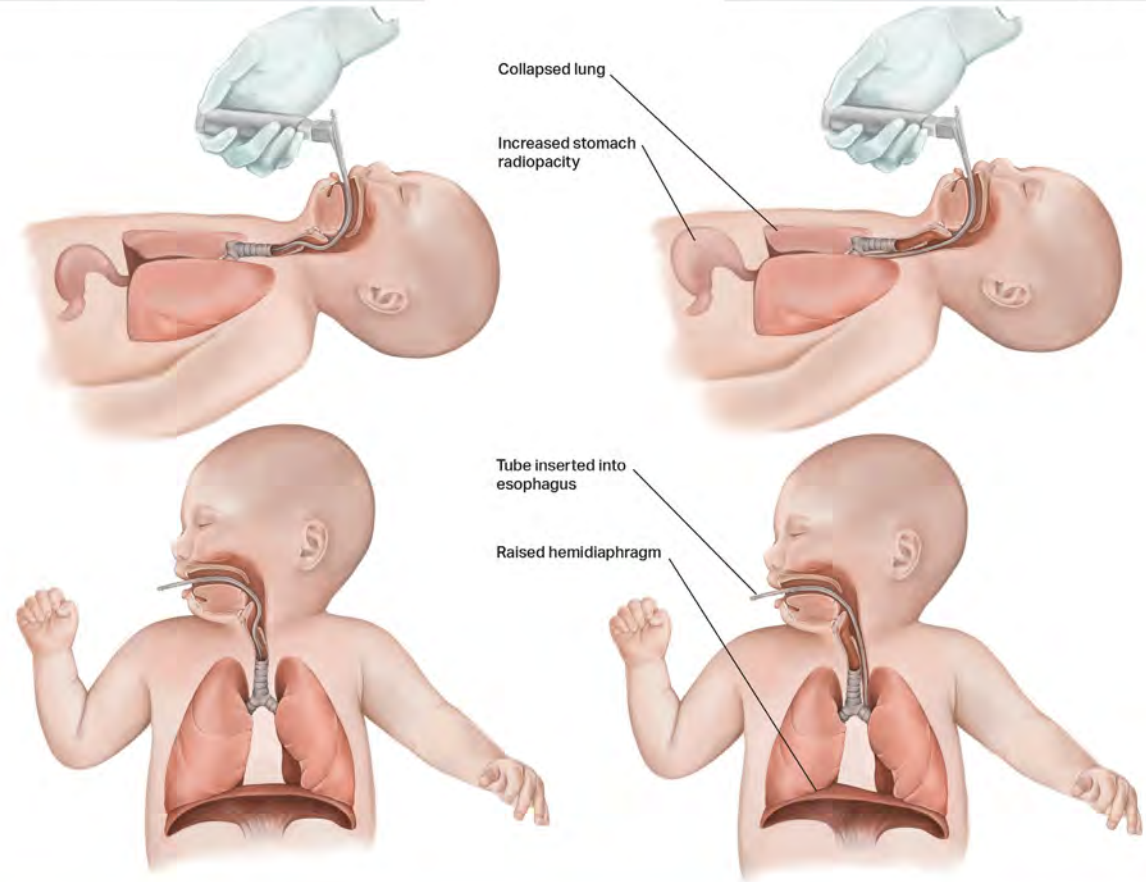


incorrect esophageal intubation

ENDOTRACHEAL INTUBATION

Correct Placement: Endotracheal

Incorrect Placement: Esophageal



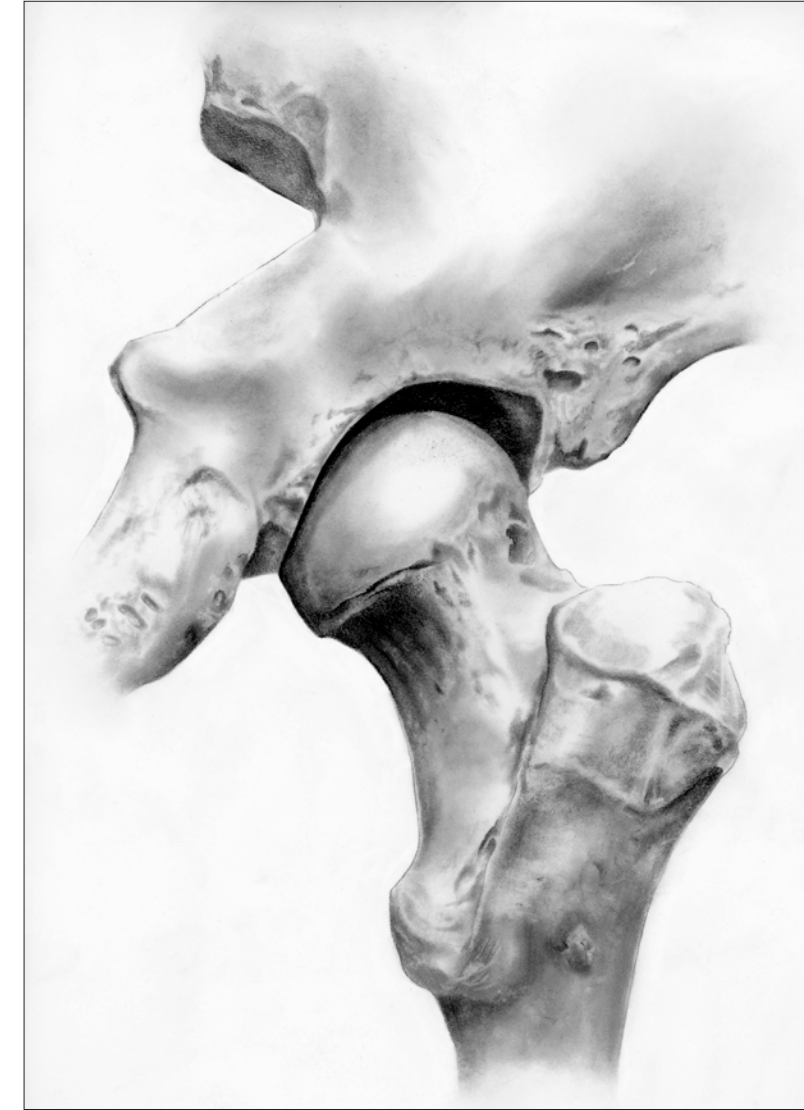
Endotracheal Intubation
Katya Cyrulik 2021
36" x 24" Digital Media



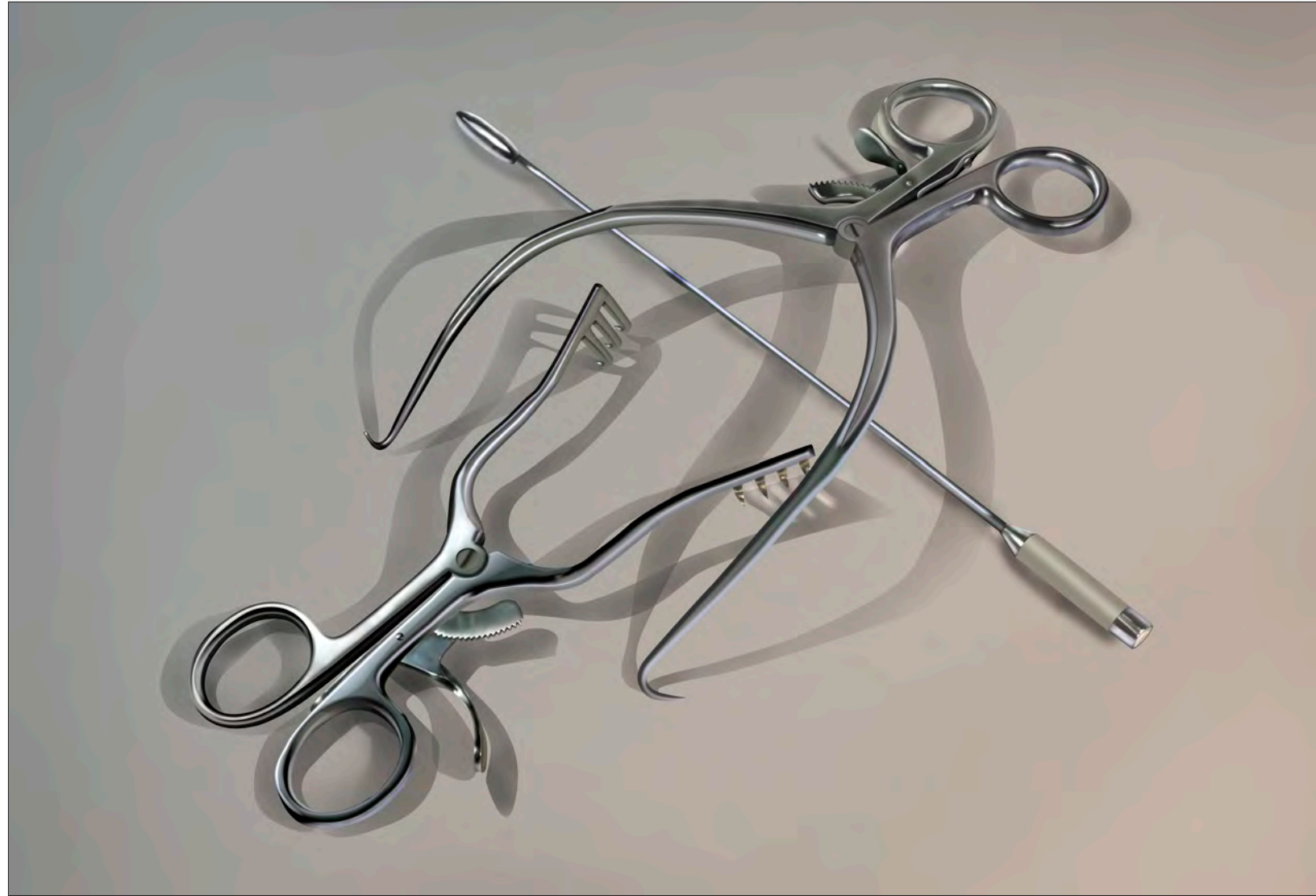
Within This Body
Katya Cyrulik 2020
24" x 18" Digital Media



Elbow Joint Study
Courtney Hand 2022
9" x 12" Graphite



Hip Joint
Isabel Dory 2021
12" x 9" Graphite on Vellum



Surgical Instruments
Santiago Gomez-Vargas 2018
32" x 48" Digital Media

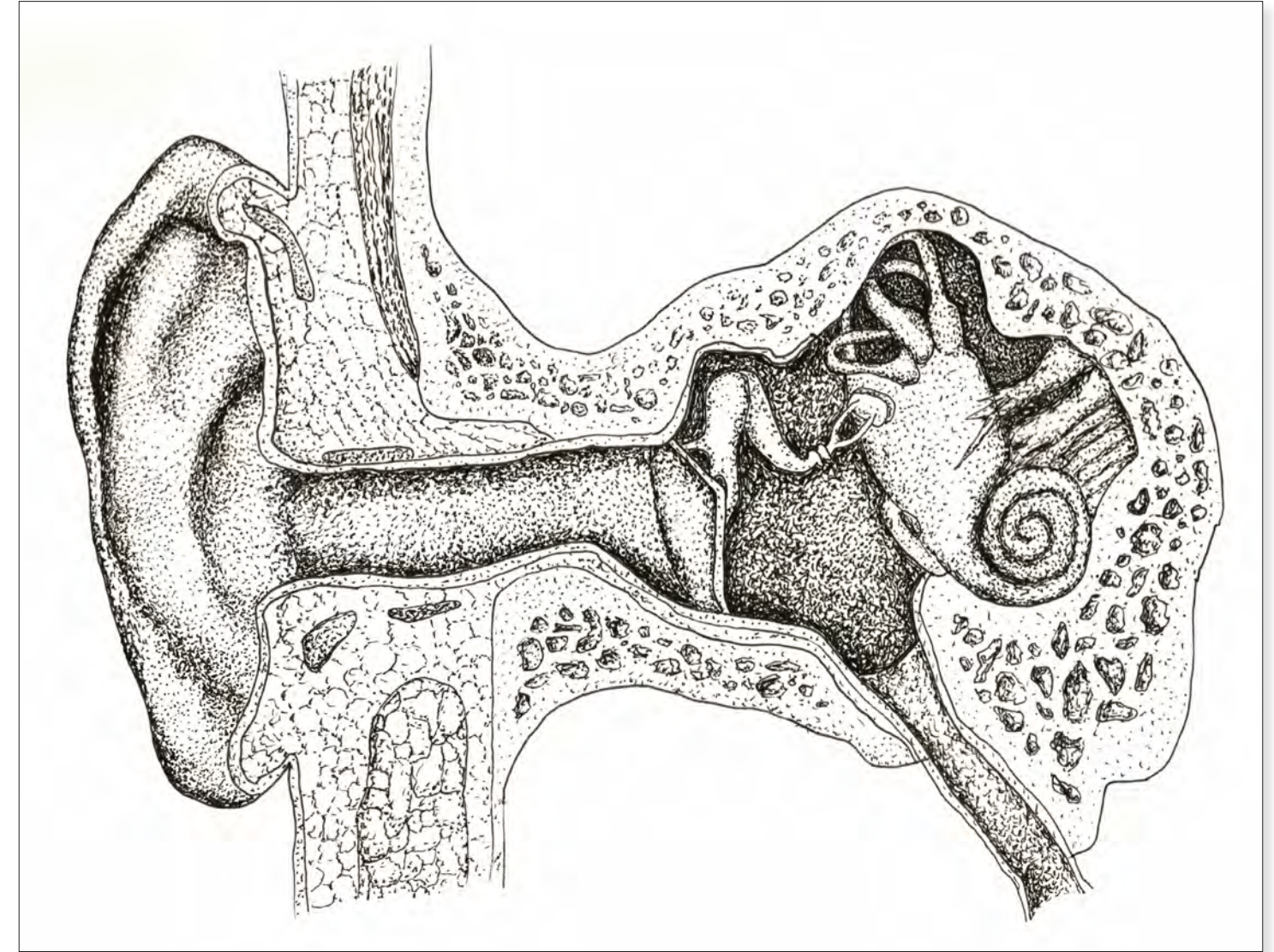
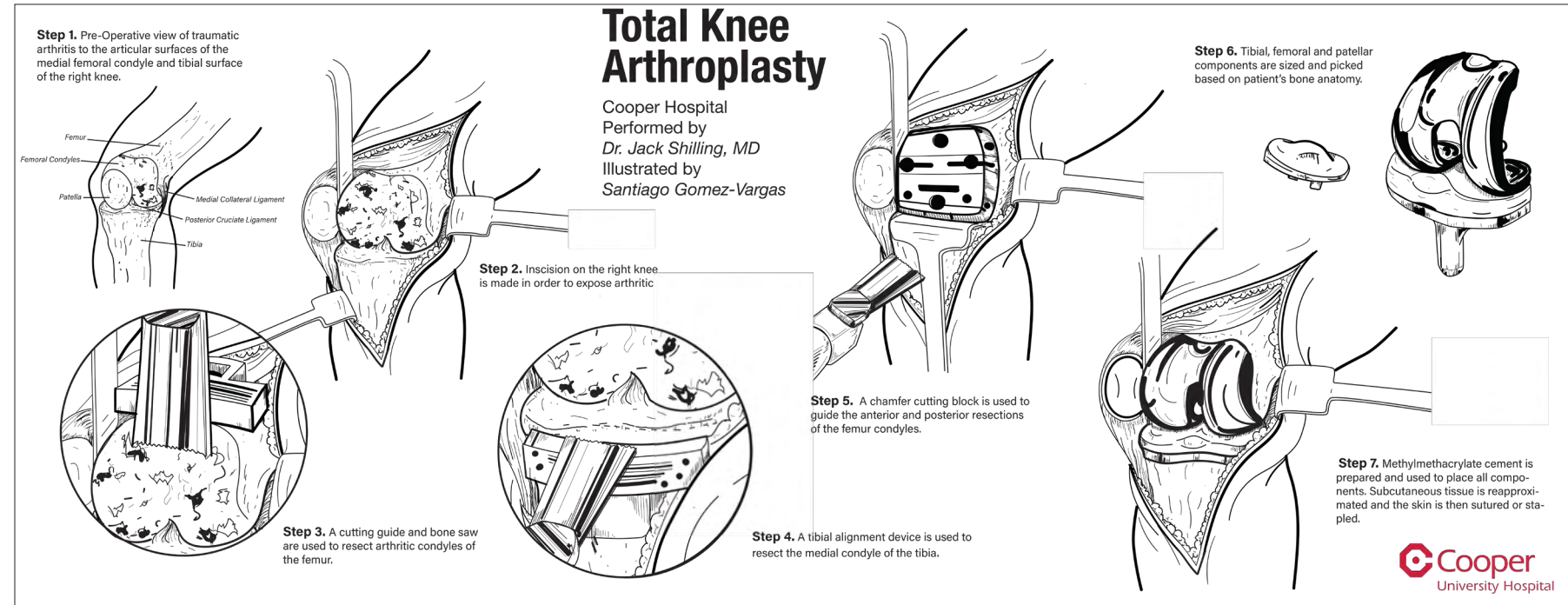
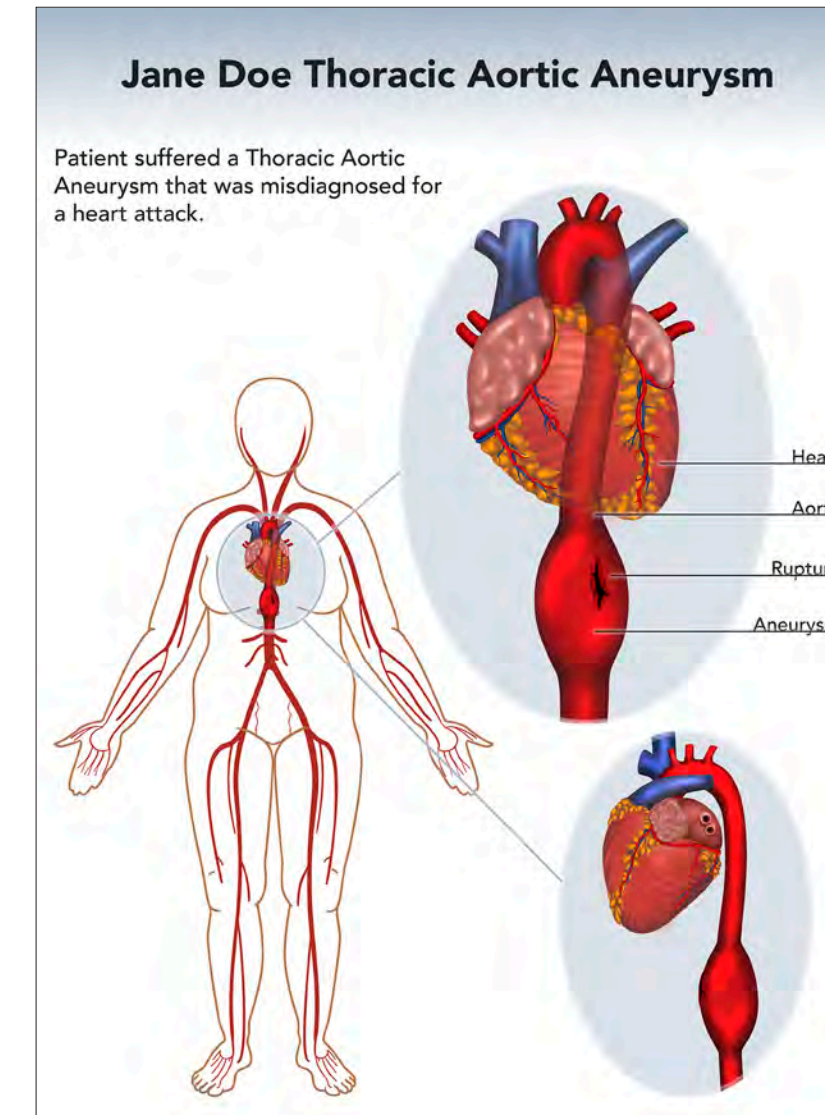


Diagram of the Ear
Emerson Harman 2020
9" x 12" Pen and Ink



Total Knee Arthroplasty
Santiago Gomez-Vargas 2019
10" x 24" Digital Media



Jane Doe Thoracic Aortic Aneurysm
Kayla Deuter 2021
36" x 24" Digital Media

WHAT IS ROSACEA?

Rosacea is a chronic but treatable, inflammatory disease that affects a person's face, primarily the cheeks, nose, chin, and forehead. Rosacea's underlying cause is unknown at the moment, however there are several theories ranging from skin mites to inability to break down fats near the epidermal layer.

Rosacea can be heritable from parents to their children and can also come about without family history of the disease. Rosacea can occur and develop at any age. Surveys indicate that symptoms of the disease start to appear after the age of 30, however this can start earlier.

Women are more commonly affected than men and people of Celtic origin seem to be more affected than the average population. Some 16 million Americans are affected by rosacea and up to 415 million people worldwide have rosacea.

TYPE 1: Erythematotelangiectatic rosacea (ETR) is the most common type it presents with flushing of the face and often occurs with papulopustular rosacea. Visible blood vessels may be present. The patient will complain about skin sensitivity and a burning/stinging feeling during parts of their day. This is the most common form of rosacea.



Close up of visible blood vessels and flushing

Due to rosacea's complexity a classification system was created to group signs and symptoms that usually occur together: erythematotelangiectatic, papulopustular, phymatous and ocular. These can occur in any combination or on their own.

LEEZA DULLER

Treatment for rosacea is extremely variable and changes from patient to patient. There is no known cure, however there are strategies and treatments to avoid flare ups. Patients are recommended to avoid direct sunlight and to wear broad spectrum sunscreen. Some treatment strategies employ the use of cyclin drugs to treat the papules and pustules. Some strategies employ the use of anti-parasitic, such as ivermectin, to control mite populations on our skin. Some strategies will look to avoid certain foods or common allergens to try and bring overall inflammation down. Using a trial and error approach, many who suffer from rosacea can find ways to mitigate their worst symptoms and live a normal life.



TYPE 2: Papulopustular rosacea's (PPR) symptoms include papules and pustules, burning and stinging of the face, broken blood vessels, and raised scaly patches known as plaques. These papules and pustules may resemble acne however whiteheads and blackheads do not present with PPR rosacea.



TYPE 3: Phymatous rosacea can affect the nose, chin, forehead, eyes, and eyelids. Phymatous of the nose is the most common symptom, with a pronounced thickening of the skin in irregular patches. Sebaceous glands will become enlarged and scar over in later stages of the illness. Arteries close to phymatous will be enlarged and with inflammatory tissue scarring. Commonly diagnosed in men.



TYPE 4: Ocular rosacea symptoms range from minor irritation, foreign body sensation, dryness, and blurry vision to more severe inflammatory keratitis of the eye. Patients describe a gritty feeling and commonly forms of conjunctivitis. Rarer forms of this sub-type include eyelid thickening, epithelial erosions, and corneal inflammation/scarring.

Resources: Mikkelson, C. S., Holmström, H. R., Kjellman, P., Heidenheim, M., Keppinen, A., Bjerring, P., & Huidt-Nyström, T. (2016). Rosacea: a Clinical Review. *Dermatology reports*, 8(1), 6387. <https://doi.org/10.4081/der.2016.6387>
van Zuuren, E. J. (2017). Rosacea. *New England Journal of Medicine*, 377(18), 1754-1764.

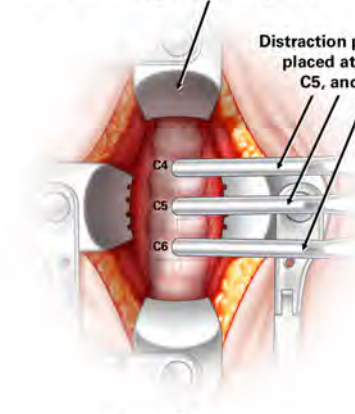
LEEZA DULLER

C4-5 and C5-6 Anterior Cervical Discectomy and Fusion

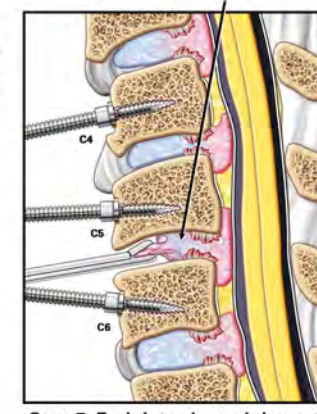
Step 1: Left horizontal incision made over C4, C5, and C6



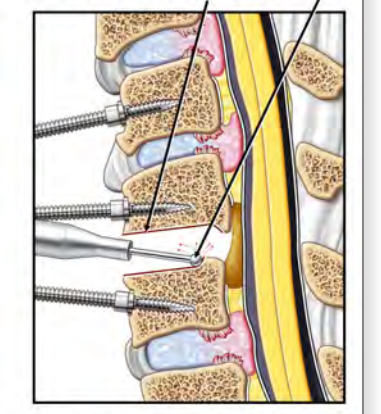
Step 2: Anterior spine exposed and self-retaining retractors placed



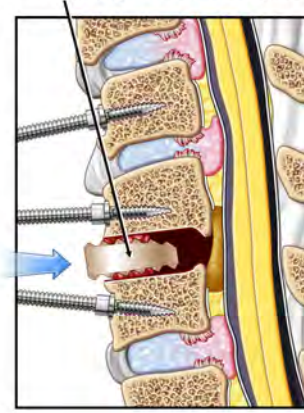
Step 3: Discectomy performed at C5-6



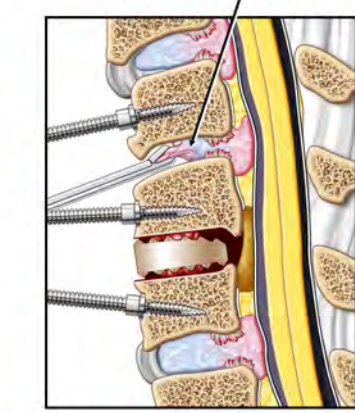
Step 4: Vertebral endplates burred down to bleeding bone



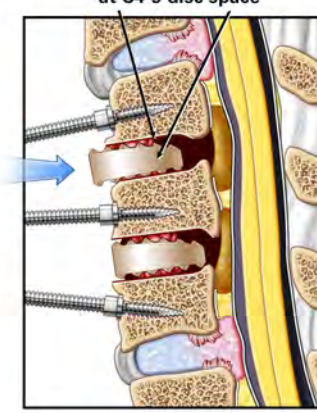
Step 5: Placement of PEEK cage at C5-6 disc space



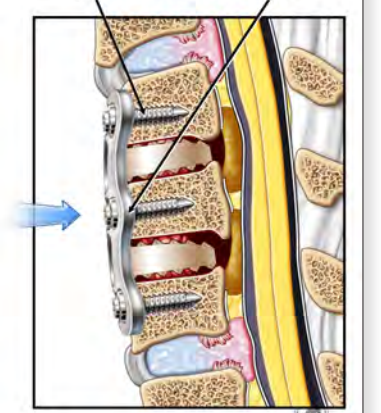
Step 6: Discectomy performed at C4-5



Step 7: Endplates burred down to bleeding bone, PEEK cage placed at C4-5 disc space



Step 8: Anterior vertebral plate affixed with screws



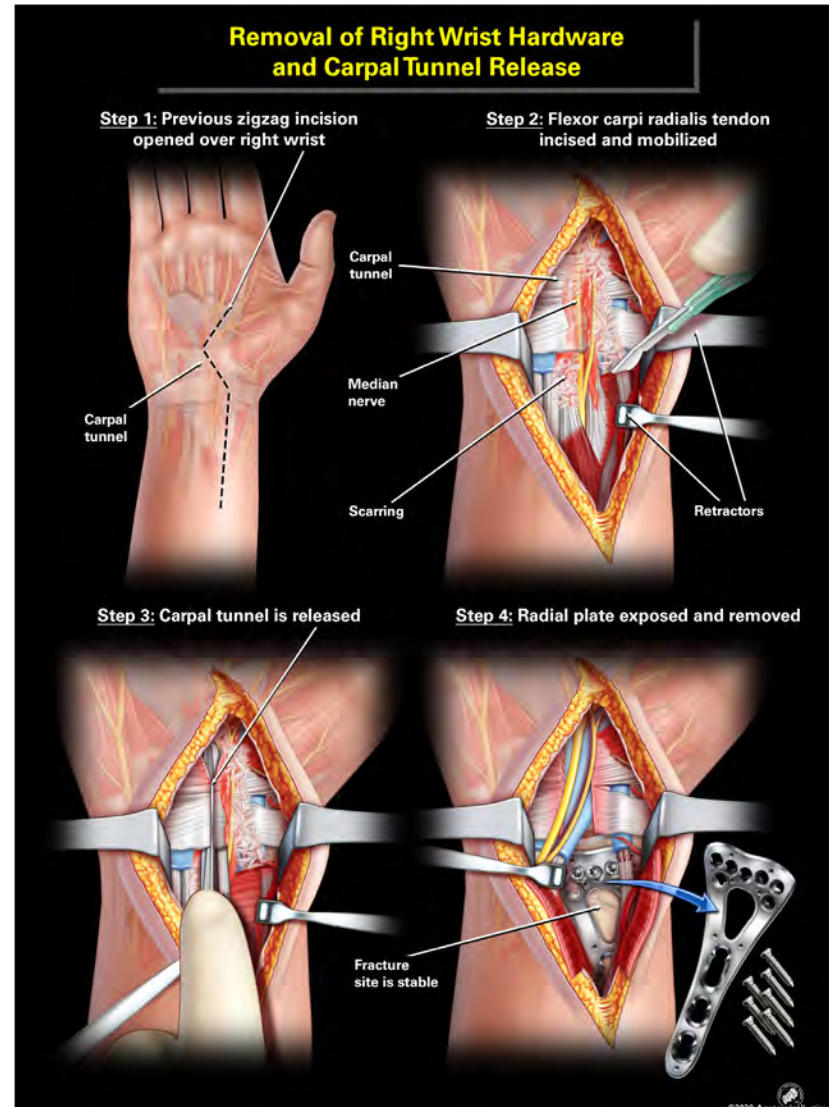
©2020 AnatomicalJustice

What is Rosacea

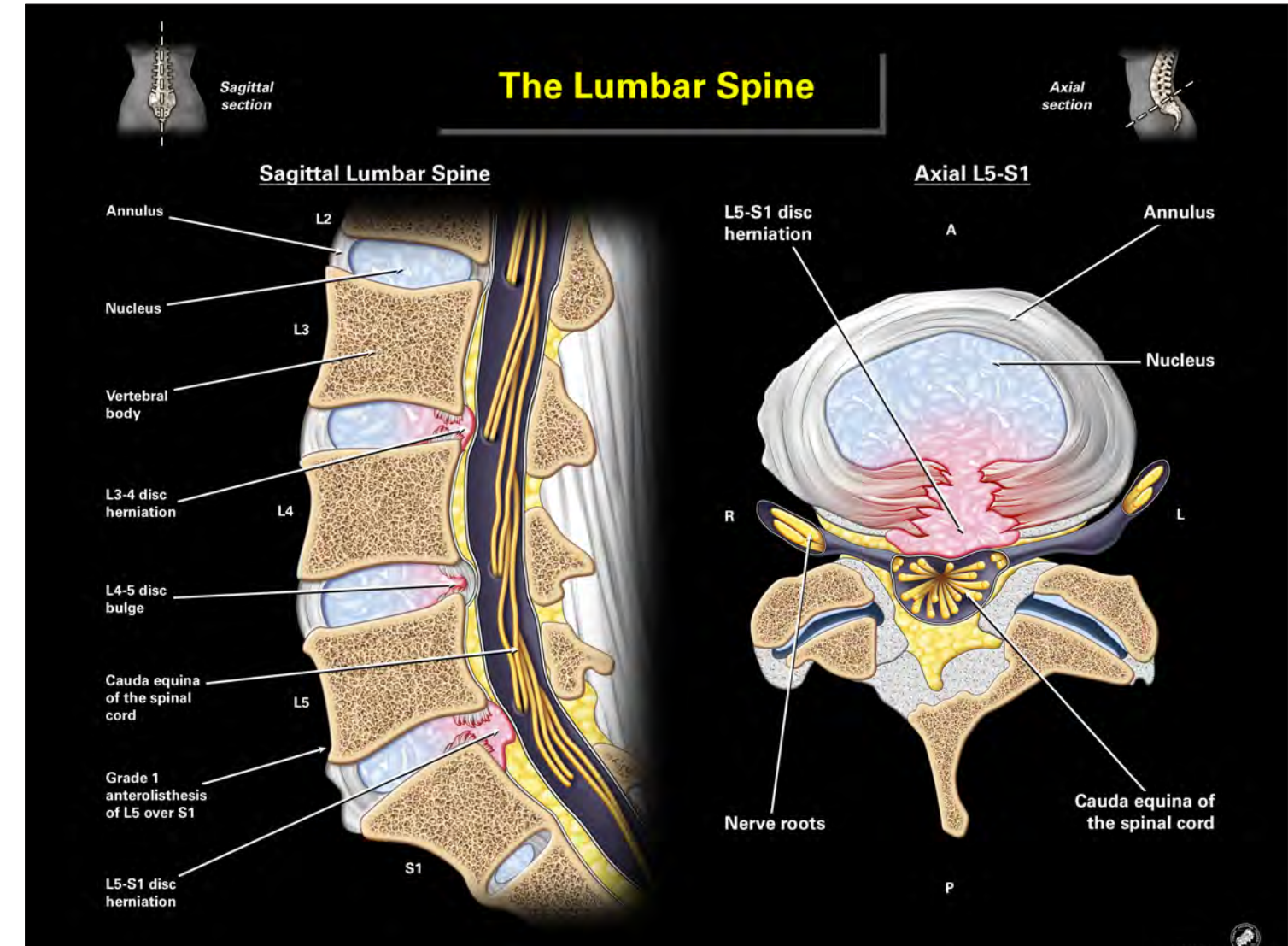
Leeza Duller 2021
11" x 8.5" Digital Media

C4 – C5, C6: Anterior Cervical Discectomy and Fusion

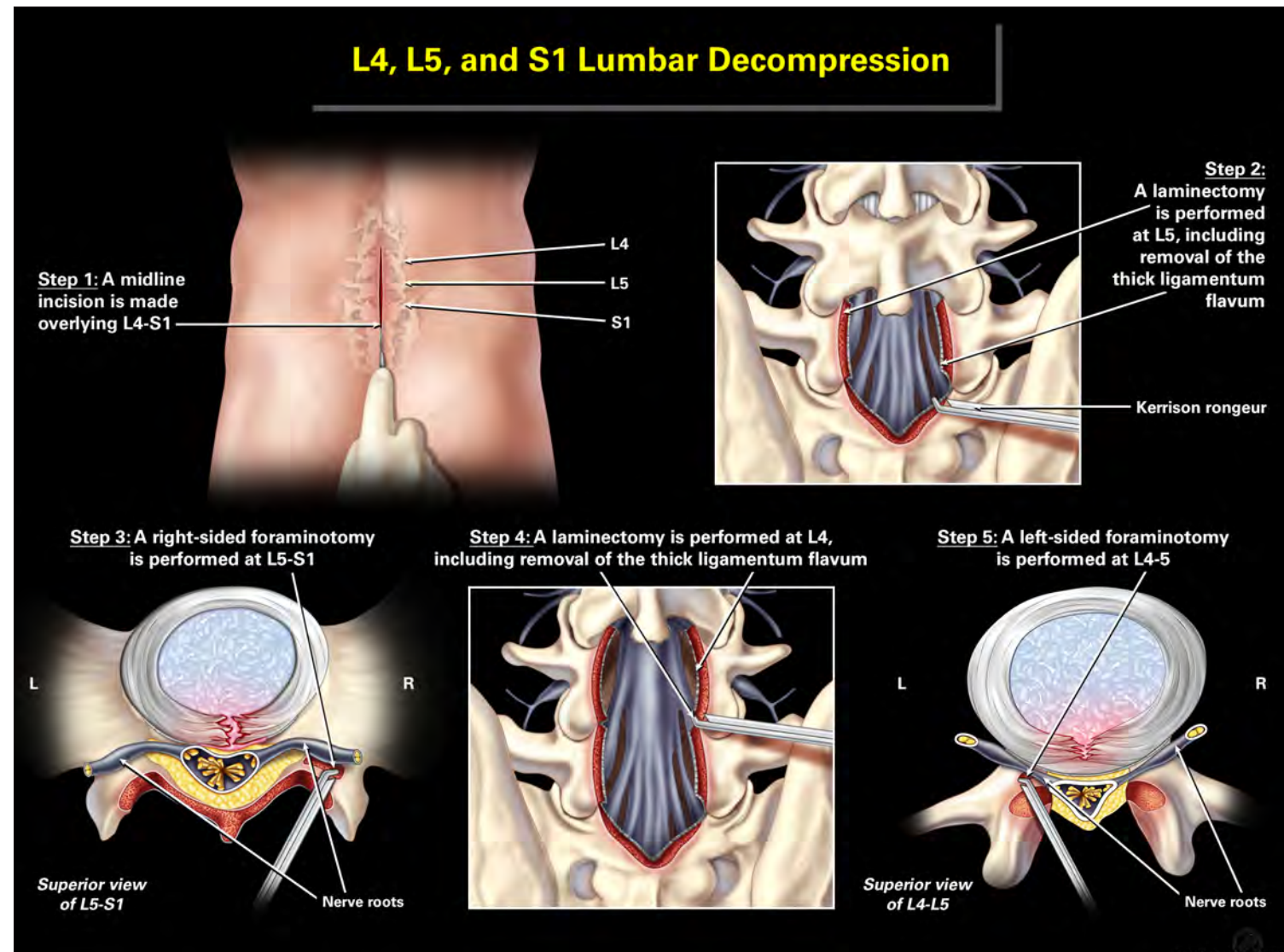
Emily Higgins and Anatomical Justice 2021
24" x 18" Digital Media



Removal of the Right Wrist Hardware/Carpal Tunnel Release
 Emily Higgins and Anatomical Justice 2021
 24" x 18" Digital Media



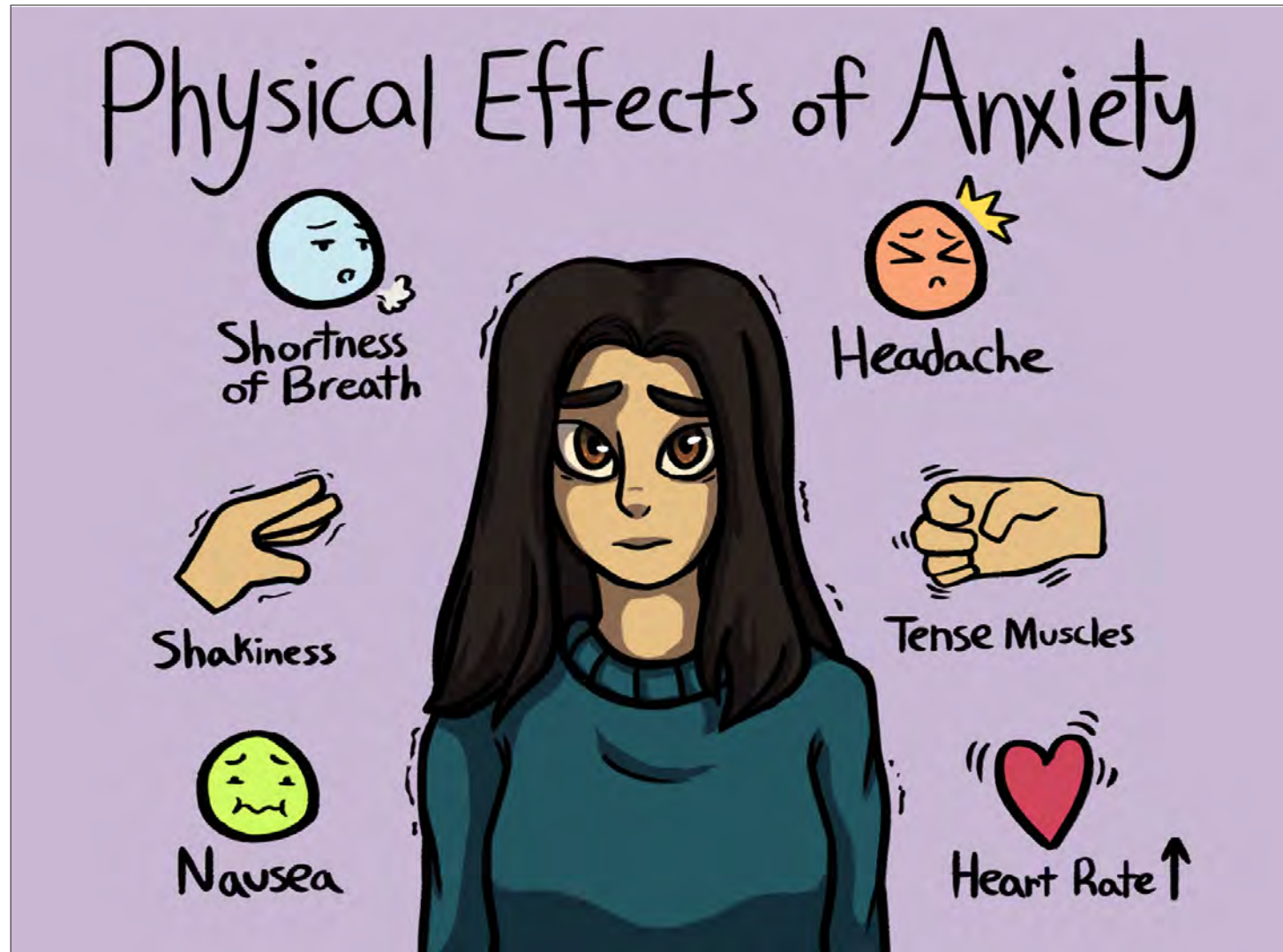
The Lumbar Spine
 Emily Higgins and Anatomical Justice 2021
 24" x 18" Digital Media



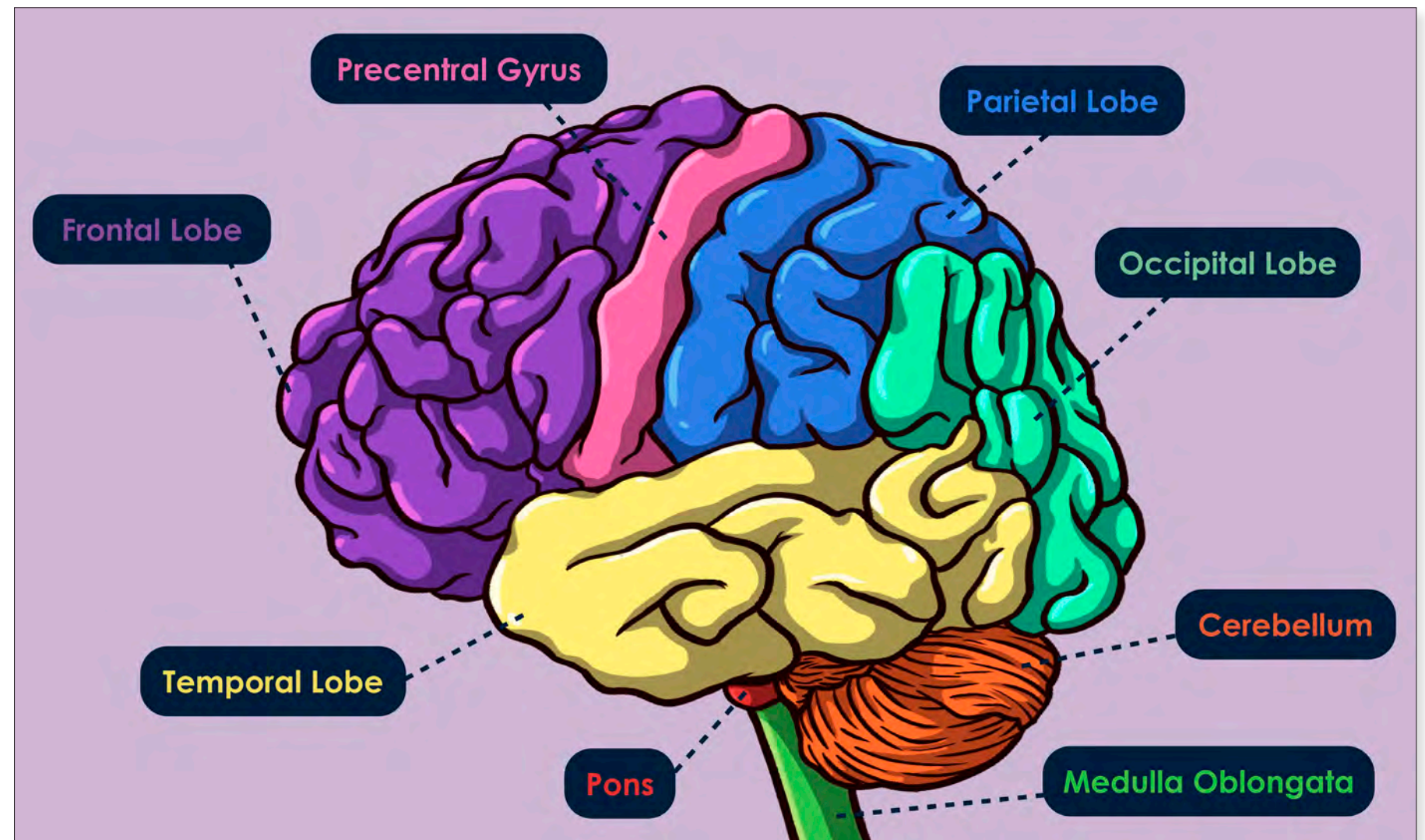
L4, L5 and S1 Lumbar Decompression
 Emily Higgins and Anatomical Justice 2021
 24" x 18" Digital Media



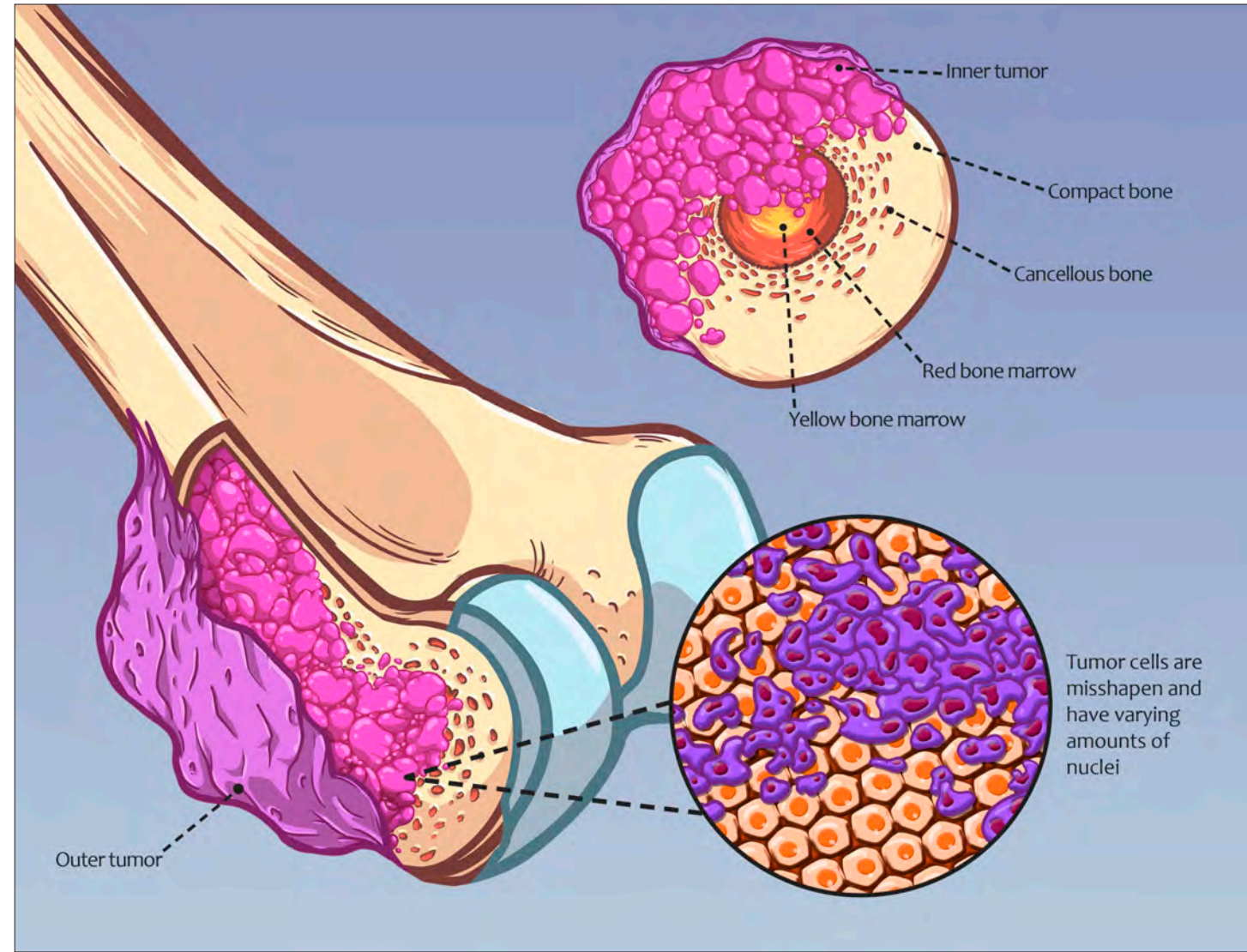
John Doe: Bimalleolar Fracture
 Hannah Knight 2021
 24" x 18" Digital Media



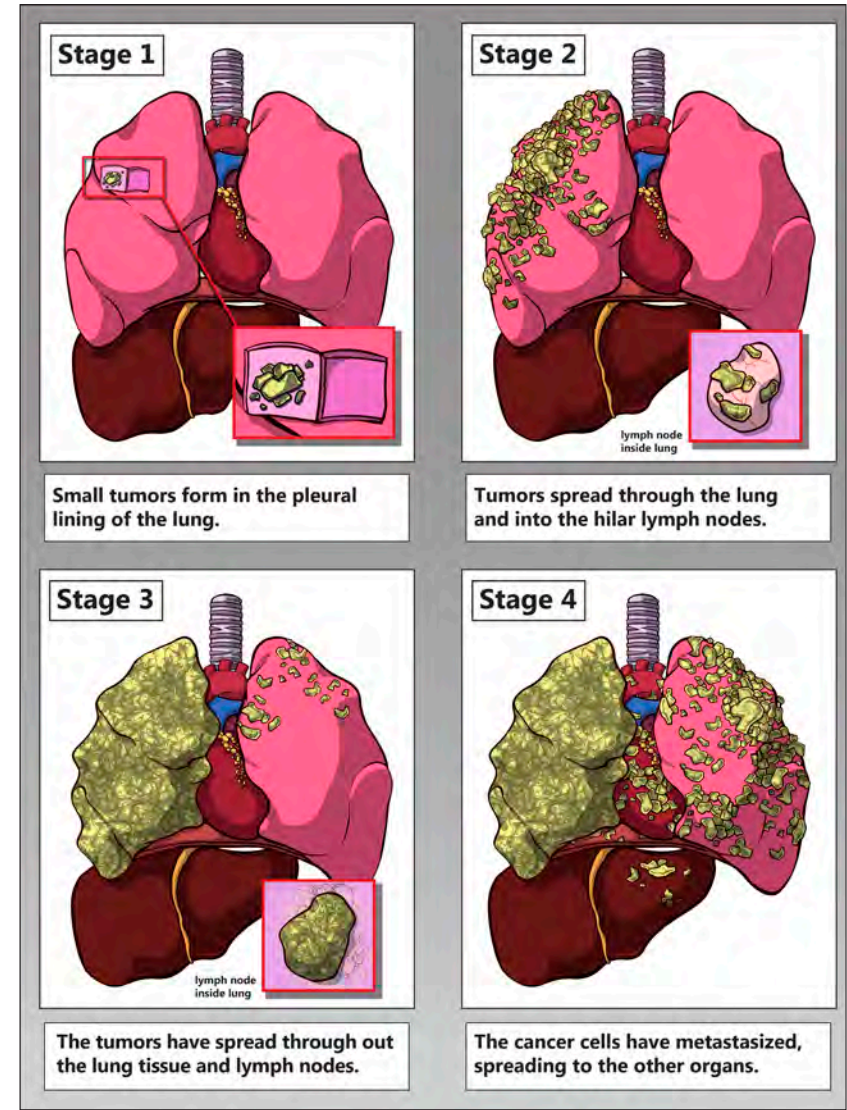
Physical Effects of Anxiety
 Danielle Jewell 2020
 9" x 12" Digital Media



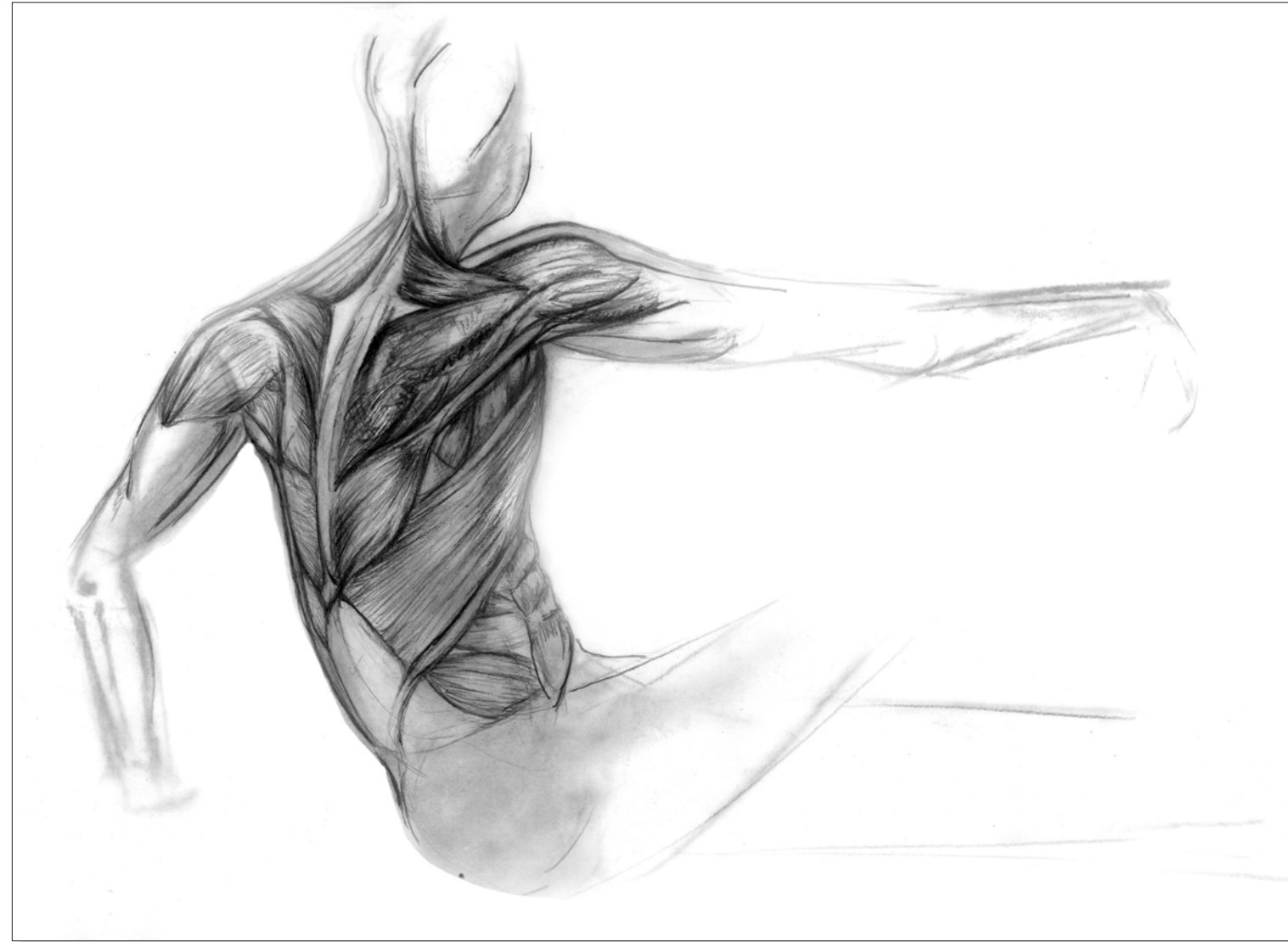
Labelled Brain Anatomy
 Danielle Jewell 2020
 9" x 12" Digital Media



Osteosarcoma
 Danielle Jewell 2020
 9" x 12" Digital Media



Lung Cancer Disease Cycle
 Danielle Jewell 2020
 24" x 18" Digital Media



Don't Look Back
Shannon Kanak 2021
9" x 12" Charcoal and Graphite

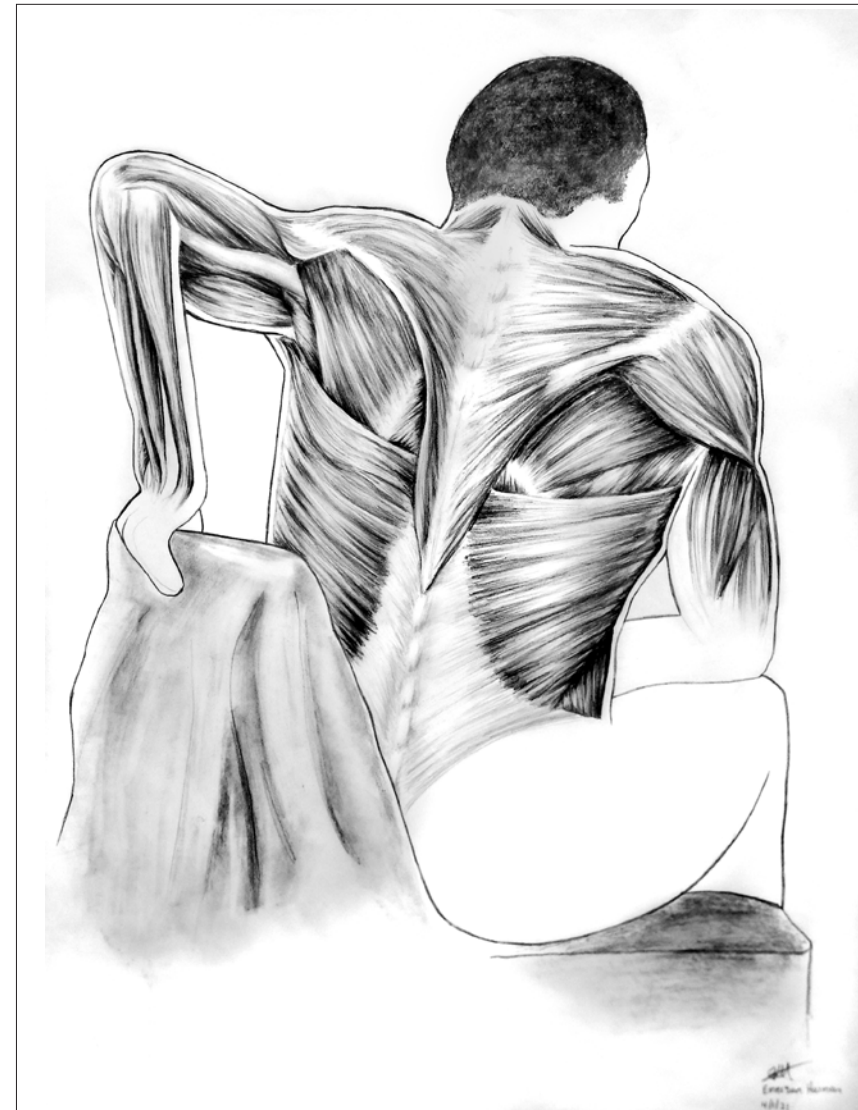
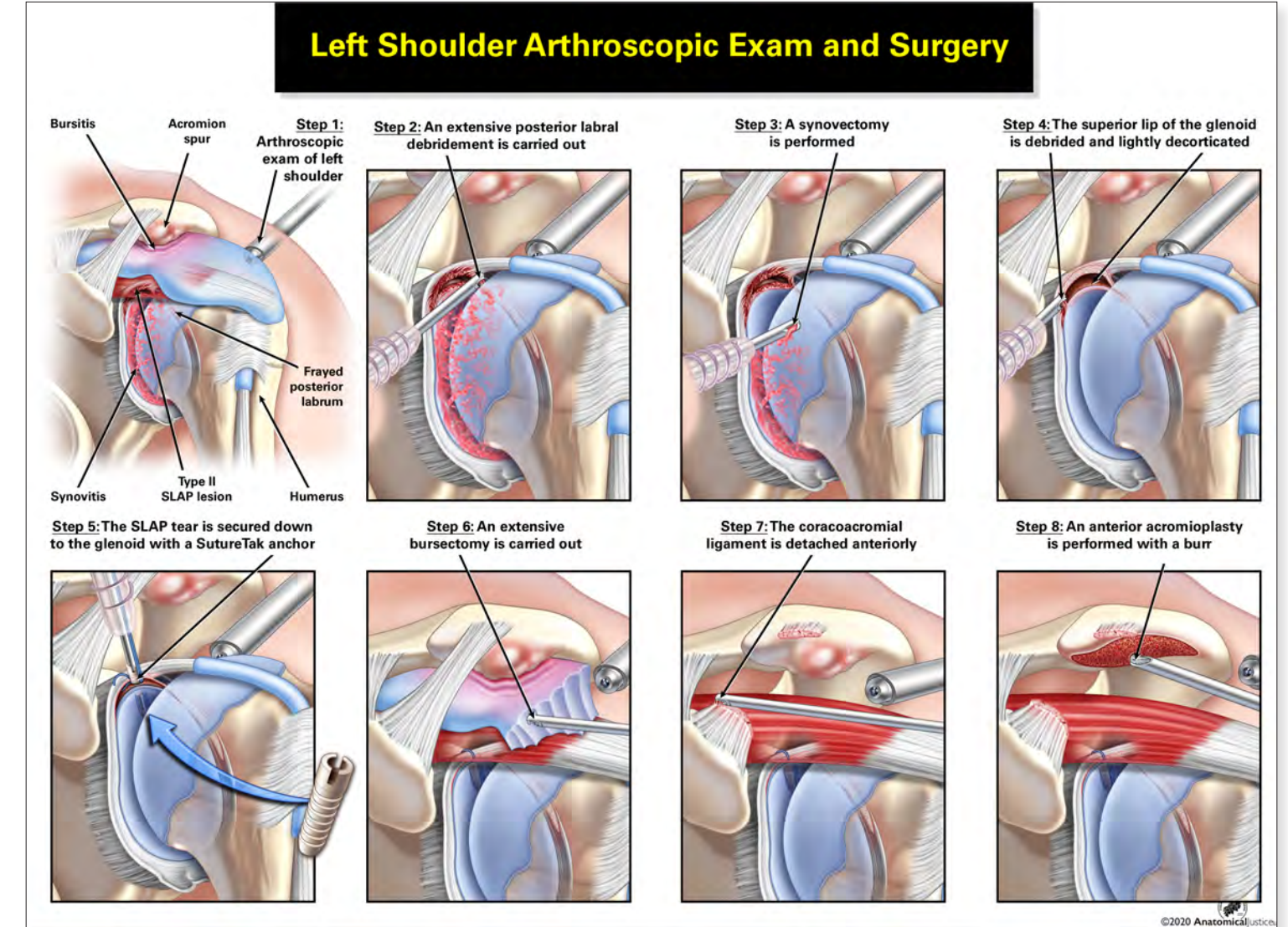


Figure with Posterior Musculature
Emerson Harman 2021
24" x 18" Pen and Ink



Skin, Muscles and Bone
 Diana Lahr 2020
 18" x 24" Colored Pencil



Left Shoulder Arthroscopic Exam and Surgery
 Emily Higgins and Anatomical Justice 2021
 24" x 18" Digital Media

The Basics of Mammograms

What is a Mammogram?

A mammogram is a medical test that is used to look for signs of breast cancer. A machine is used to take an x-ray picture of the breast. More tests may need to be done if anything abnormal is found on your mammogram.

When should you start mammograms?

Women **40-44** Can begin mammograms

Women **45-54** Once a year

Women **55+** Every other year

How is a mammogram performed?

- 1 Patient stands in front of x-ray machine specifically for mammograms
- 2 Breast is placed on a plastic plate adjusted to patient's height
- 3 A second plate presses down on the breast from above
- 4 An x-ray picture is taken from this position
- 5 Steps are repeated for a side view x-ray of the breast
- 6 Process is then completed on the opposite breast

Symptoms of Breast Cancer



Change in breast size or shape



Changes in Nipple



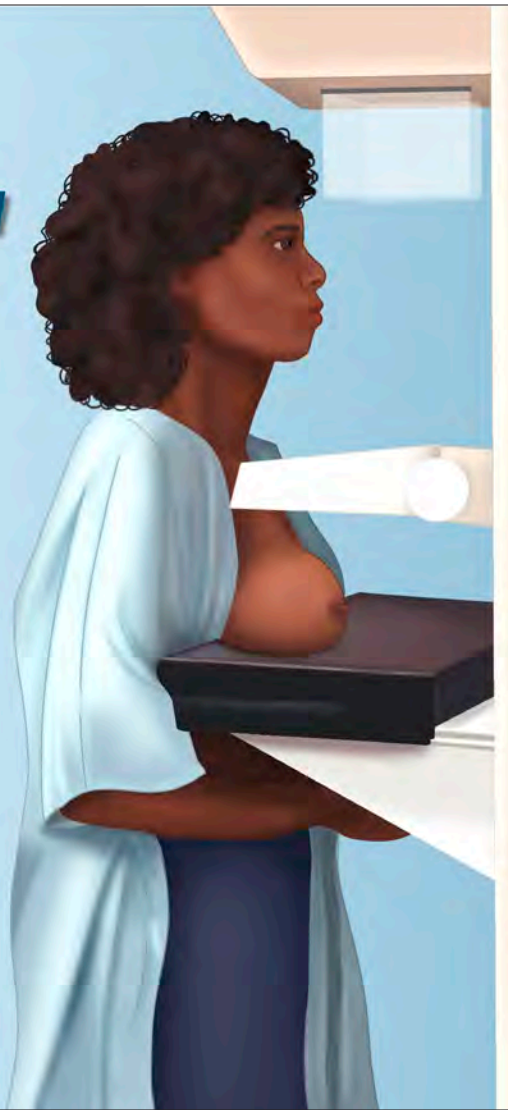
Thick, rigid, or dimpled skin



Abnormal Lumps



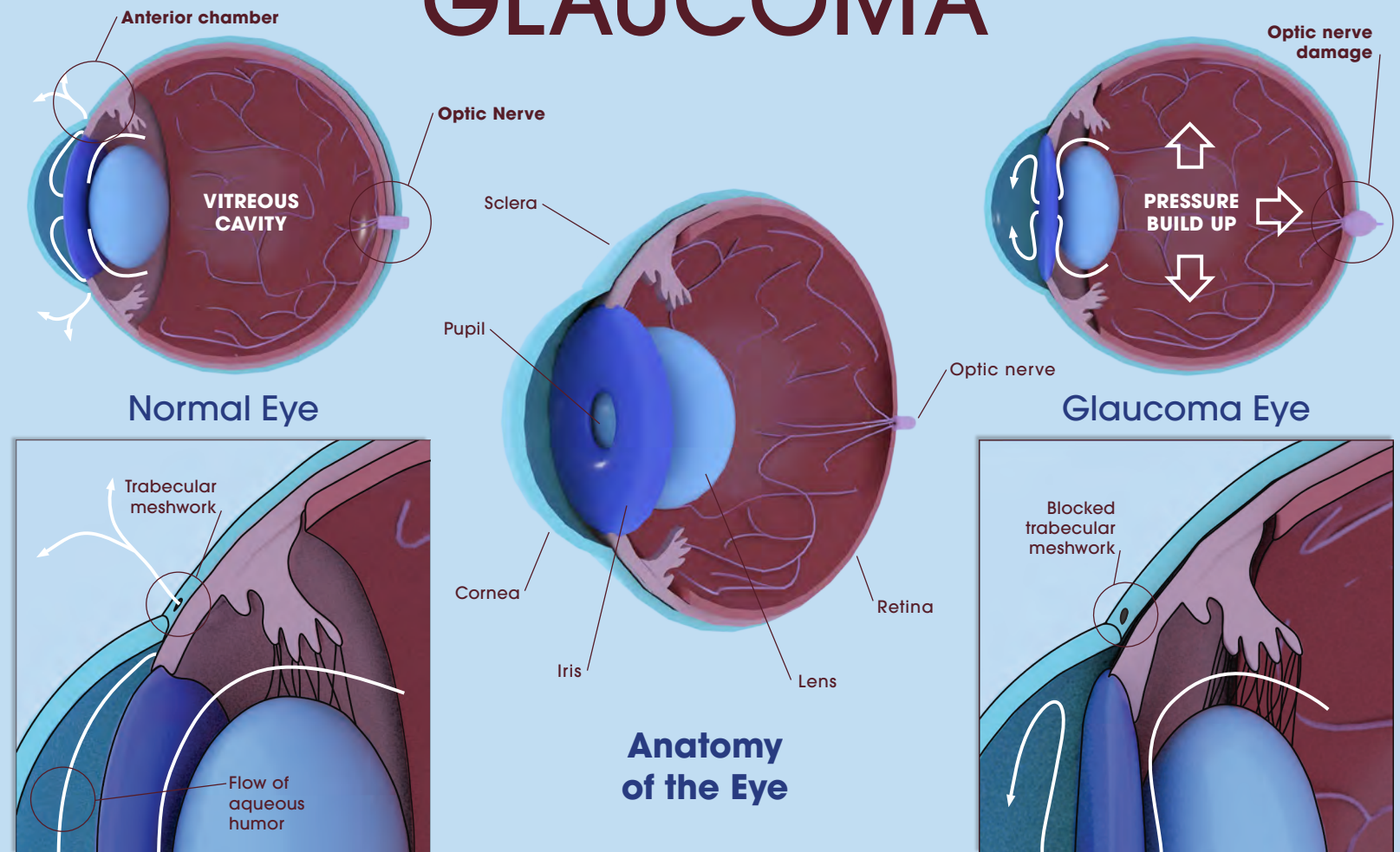
Nipple Discharge



The Basics of Mammograms

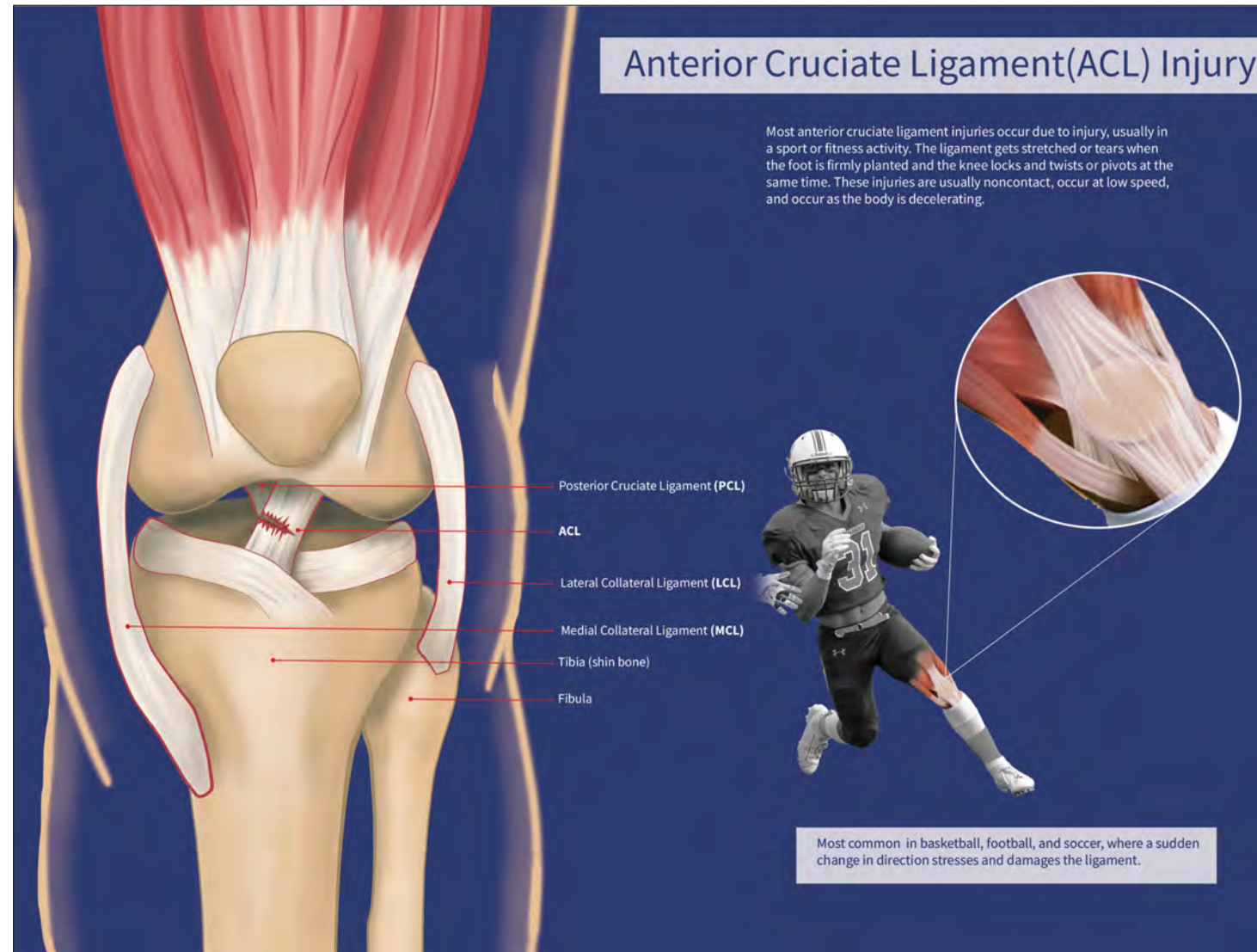
Jessica Angelini 2021
18" x 24" Digital Media

GLAUCOMA

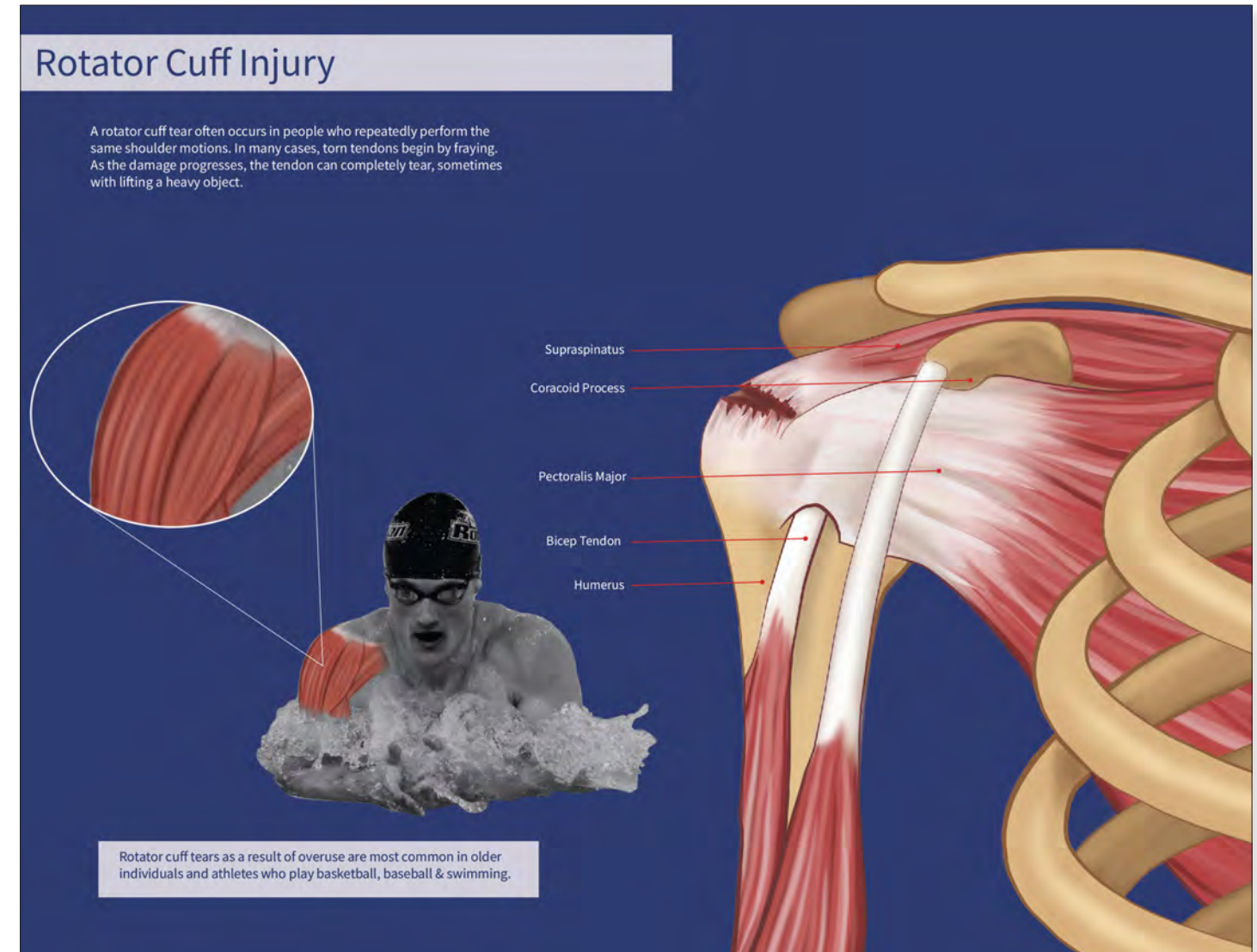


Glaucoma

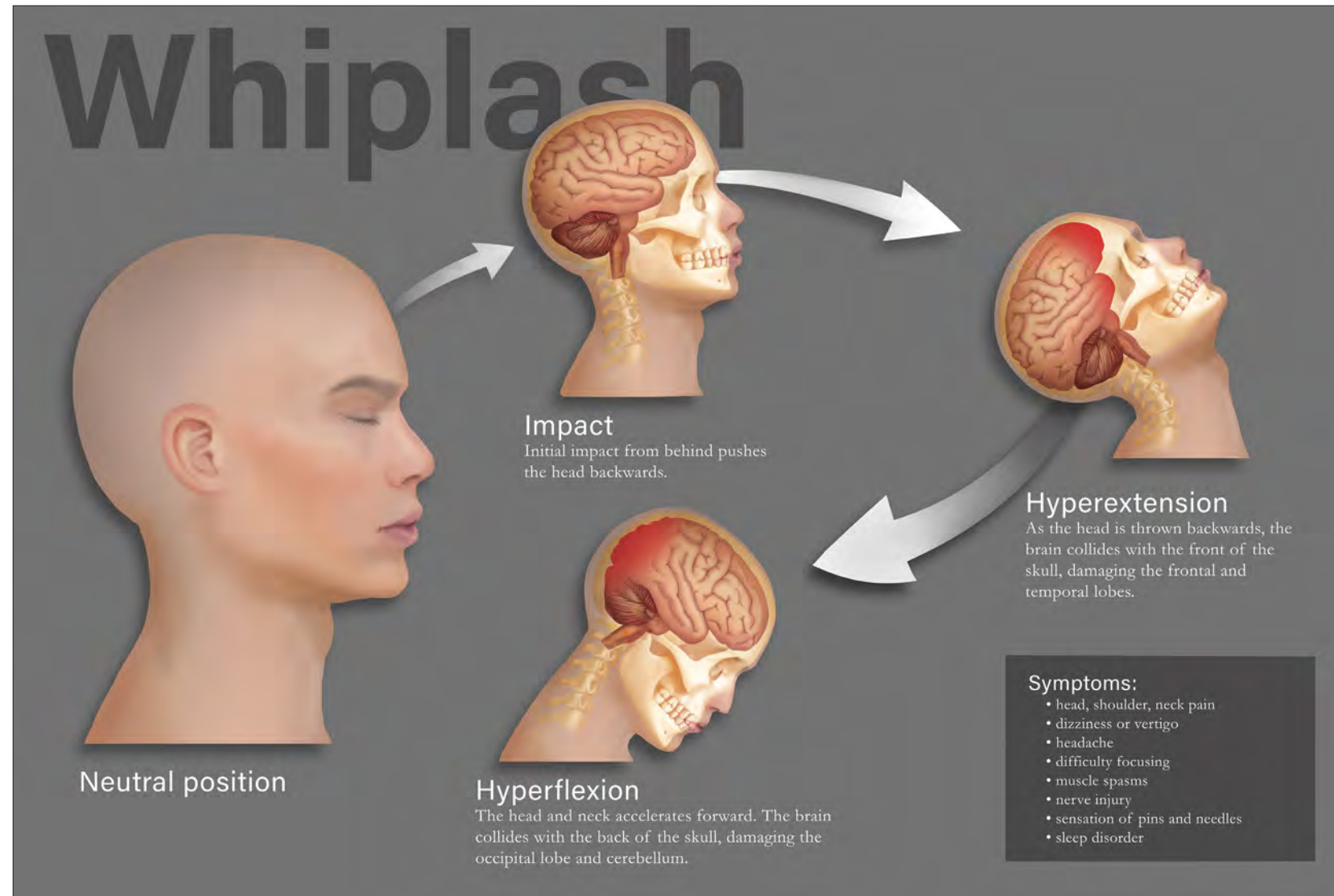
Lilly Smith 2020
10" x 12" Digital Media



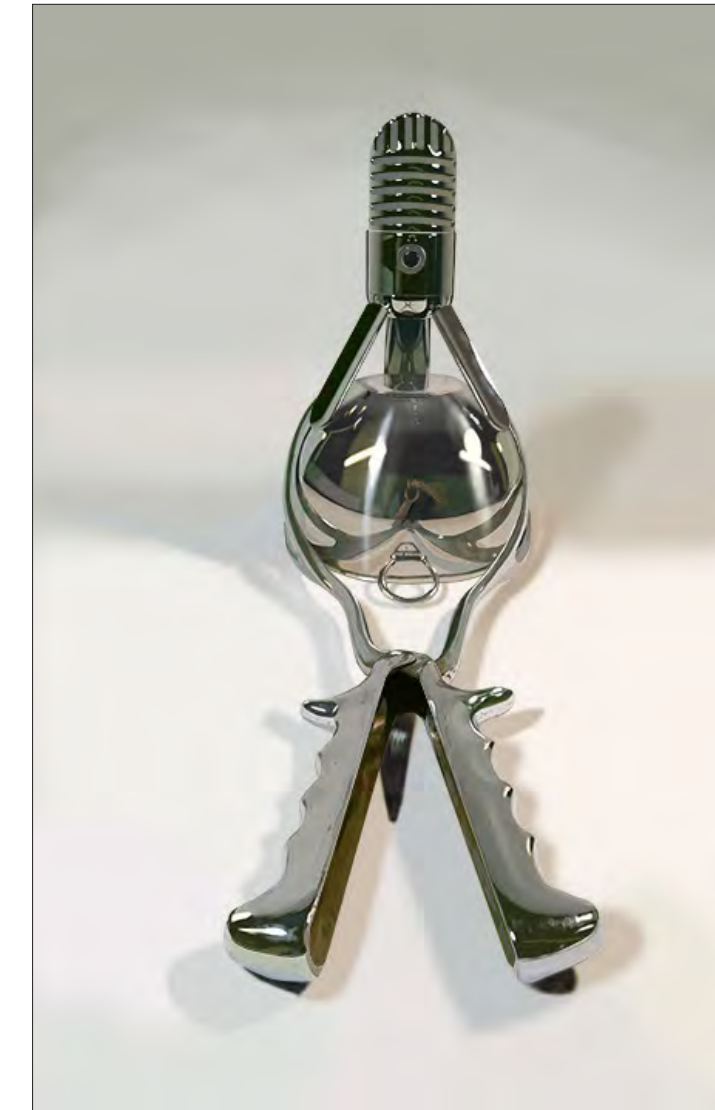
Football ACL Injury
 Megan Miller 2021
 18" x 24" Digital Media



Swimmer Rotator Cuff Injury
 Megan Miller 2020
 18" x 24" Digital Media



Whiplash TBI Injury
Terry Nguyen 2020
18" x 24" Digital Media



Reflections
Megan Miller 2019
32" x 48" Digital Media

The Drunken Kidney

Alcohol's harmful effects on renal function

The kidneys filter and monitor our blood to maintain homeostasis and rid us of toxins, including alcohol. Overloading the kidneys with this toxin can have detrimental effects.

The immediate effects of alcohol impair the kidneys ability to regulate blood volume and electrolyte composition. Alcohol **inhibits the release of antidiuretic hormone (ADH)**, a hormone that increases reabsorption of water from the kidney filtrate. This means you release more water in your urine after drinking alcohol, which can lead to dehydration. This alters the concentration of electrolytes in the blood and can cause harmful side effects.

Hyponatremia (low sodium) causes impaired neurological function (in extreme cases can lead to seizures).

Hypophosphatemia (low phosphate), commonly seen in alcoholic individuals, can cause muscle weakness and breakdown, acidosis (too much acid in the blood), hypotension (low blood pressure), and can lead to kidney failure.

Hypocalcemia (low calcium) when combined with hypophosphatemia can cause life threatening convulsions and respiratory muscle spasms.

Chronic use can lead to decreased urinary volume and **Hypertension** (increased blood pressure) which strains the kidney's filtration unit, the glomerulus.

The kidney contains about 1 million nephrons, each with their own filtration unit called a glomerulus.

Multiple nephrons empty into a single collecting duct, which empties into the minor calyces through the renal papilla.

Blood runs through the glomerulus, is filtered through the podocytes, and the filtrate is collected in the Bowman's capsule.

Consistent heavy drinking **DOUBLES** your risk of kidney disease!

For women: >3 drinks per day OR >7 drinks per week
For men: >4 drinks per day OR >14 drinks per week

The Drunken Kidney
Karlee D. Rogers 2020
24" x 18" Digital Media

Gram Negative Bacteria ANTIBIOTIC RESISTANCE

ABX MOAs

- Vancomycin binds to peptidoglycan building blocks
- β -lactams (Carbapenems, Cephalosporins, Monobactams) irreversibly bind & inhibit transpeptidase (PBP)

Resistance Mechanisms:

- LPS PHYSICAL BARRIER**
- Porins DECREASED INFLUX**
- Capsule PHYSICAL BARRIER**
- Enzymes DEACTIVATION**
- Efflux Pump INCREASED EFFLUX**

Regulatory Pathways:

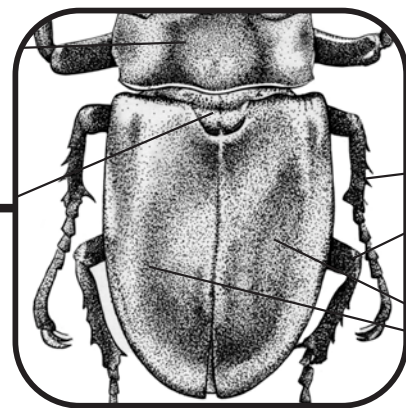
- Two Component Regulatory System ALTERED GENE EXPRESSION**
- Horizontal Gene Transfer ALTERED GENE EXPRESSION**
- Transcription** leading to **Plasmid** expression
- Signal Transduction** leading to **Transcription**

Cell Wall Structure: Outer Membrane, Peptidoglycan Cell Wall, Inner Membrane.

Other Labels: PBP, Porin, LPS, ABX, Capsular Proteins, Enzymes, Efflux Pumps.

Karlee Diane Rogers

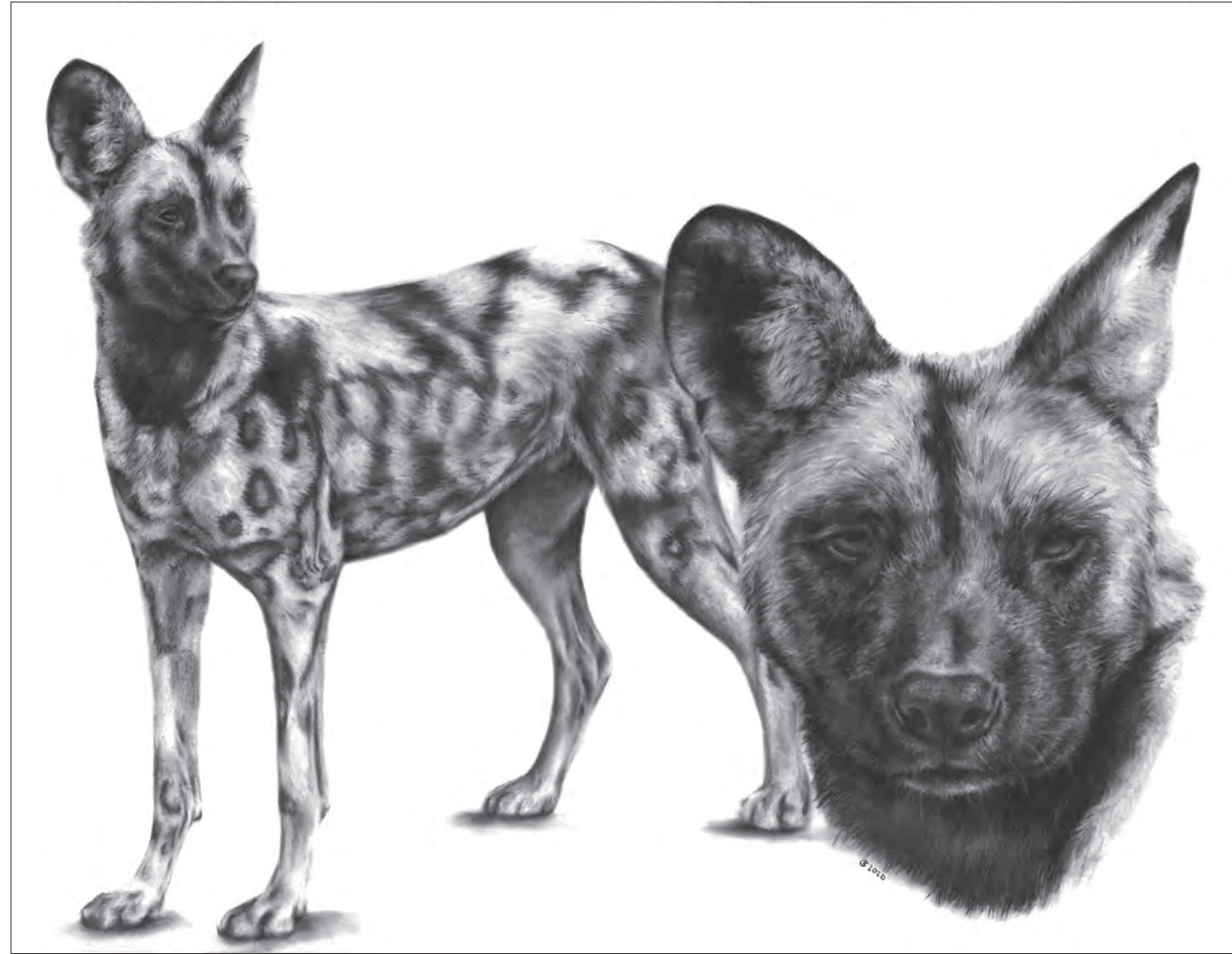
Gram Negative Bacteria: Antibiotic Resistance
Karlee D. Rogers 2020
18" x 24" Digital Media



Scientific Illustration

Science illustration is much more than pictures in a textbook. It encompasses all forms of visual science communication, including animation, comics, murals, sculpture and even jewelry.

— Guild of Natural Science Illustrators



African Painted Dogs
Katya Cyrulik 2020
12" x 18" Carbon Dust, Graphite



The Humboldt Penguins
Veronica Cava 2019
18" x 24" Digital Media

Addax *Addax nasomaculatus*

Distribution:
Formerly distributed throughout the Sahara and Libyan deserts, Algeria, Tunisia, Jordan, and Egypt, the Addax *nasomaculatus* now has less than 100 individuals in the wild with about 5,000 in captivity around the world in zoos and on private ranches. In 1986, the status changed to "endangered" by the International Union for Conservation of Nature and Natural Resources (IUCN) and was said to be "critically endangered" in the 2004 IUCN Red Data List.

Conservation & Captive Breeding:
The Addax has lost 99% of its range since the 19th century. In the Late Pleistocene the addax went through a bottleneck, causing a major decrease in their population even before they became heavily hunted by humans. This has led to a large loss of genetic and historical mitochondrial diversity due to the very few individuals that are left in the wild. However, as long as inbreeding in captivity continues to stay low, there remains a more positive chance for programs that are reintroducing them into fenced-in areas in Tunisia and Morocco and national parks.

Ecology:
Addax have a nomadic lifestyle, traveling across deserts with very little vegetation. Instead of drinking, they obtain the majority of their hydration through the leaves, grasses, and vegetation around them. Traveling in herds of 5-20, their migration is based on rainfalls and are led by an older female of the group, who hold the highest rank. Due to their larger bodies and slow movement, they are easy prey for local people who use their skin for the soles of shoes.

The diet of the addax mainly consists of the perennial plant species *Stipagrostis pungens* (Desf.) De Winter, *Fagonia glutinosa* Delle, *Helianthemum kabiricum* Delle, and *Hammada schmittiana* (Pomel.) Botsch.

Adult addax have horns with 1.5 to 3 spirals that are oriented upward and outward from a dark brown tuft of hair on the top of their head.

They have a white patch of fur that is elongated down their cheeks, matching the color of their coat during the summer.

In the winter, their coat becomes more gray in color and they develop longer brown hair on the head, shoulders, and neck. Males are both larger and have longer horns than females.

The map of Africa shows the historical and possible extant locations of the addax.

- Extant: Chad, Niger
- Possibly Extinct: Mauritania
- Extinct: Algeria, Egypt, Libya, Morocco, Sudan, Tunisia, Western Sahara

Addax
Katya Cyrulik 2021
8.5" x 11" Digital Media

Meet Tony,

the Southern White Rhino

located in our African Plains exhibit

PHILADELPHIA ZOO
3400 West Grant Avenue • Philadelphia, PA 19104-1196
philadelphiazoo.org

The Southern White Rhino
Kayla Deuter 2019
10" x 12" Carbon Dust, Digital Media

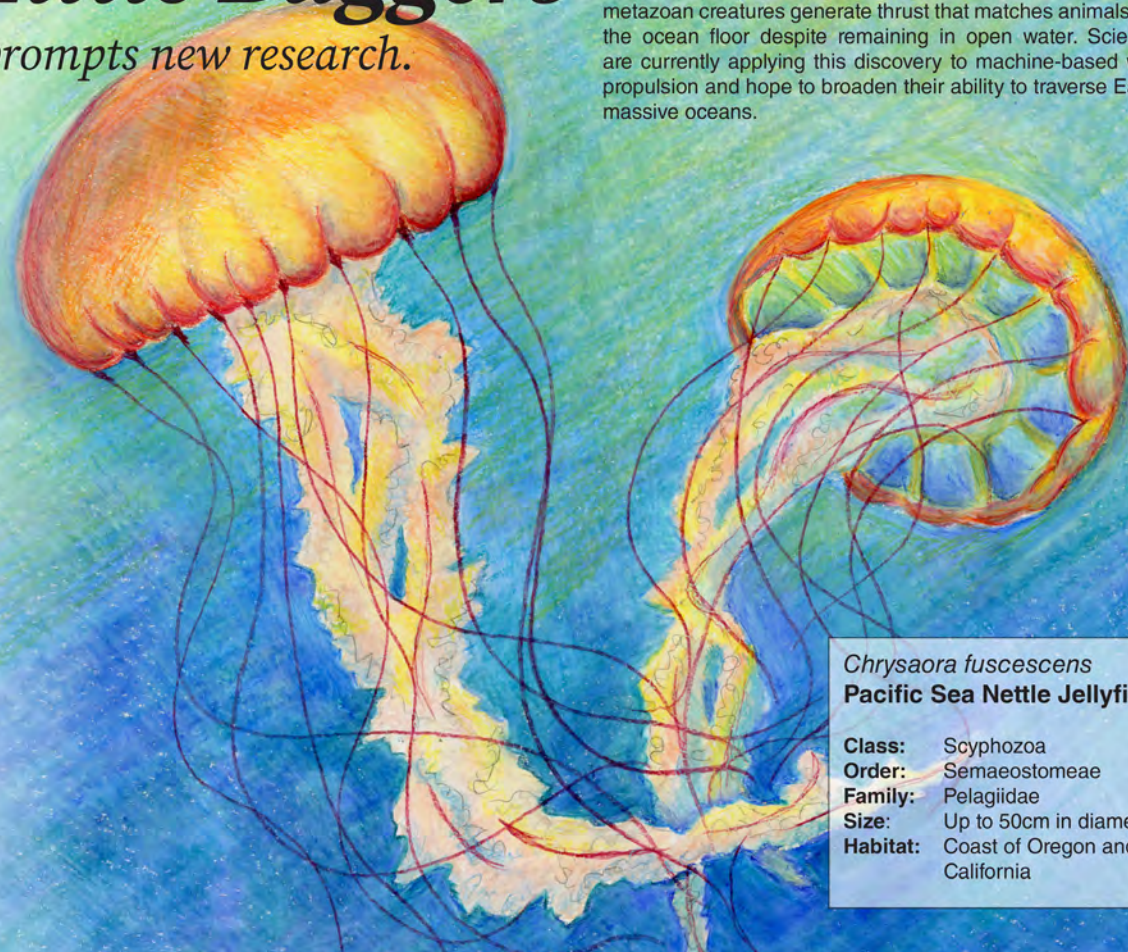
Efficient Little Buggers

Jellyfish propulsion prompts new research.

Jellyfish are among the ocean's most energetically efficient swimmers. However, their method of propulsion (see left) has been poorly studied. By generating their own "virtual wall", these metazoan creatures generate thrust that matches animals near the ocean floor despite remaining in open water. Scientists are currently applying this discovery to machine-based water propulsion and hope to broaden their ability to traverse Earth's massive oceans.

Stages of Propulsion:

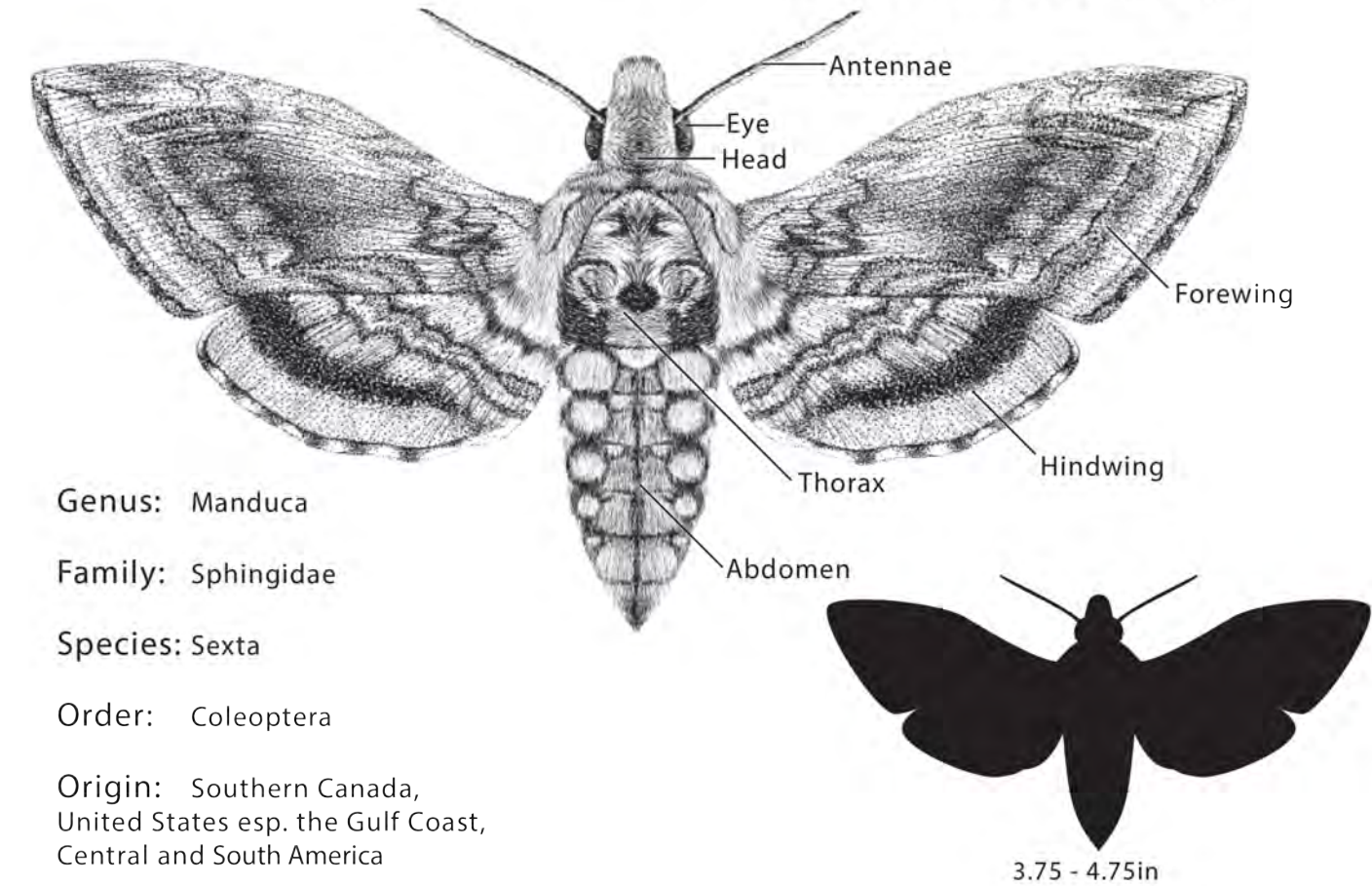
- ④ **Bell Contraction:**
The 'starting vortex' is expelled and the jellyfish is propelled forward. The cycle begins again.
- ③ **Expansion:**
The 'stopping vortex' tucks up into the bell and dissipates. The 'starting vortex' is generated. Forward motion ceases.
- ② **Passive Energy Capture:**
The 'stopping vortex' begins to travel upward into the bell. Momentum carries the jellyfish onward.
- ① **Bell Contraction:**
The 'starting vortex' is expelled and 'stopping vortex' is generated. The jellyfish is propelled forward.



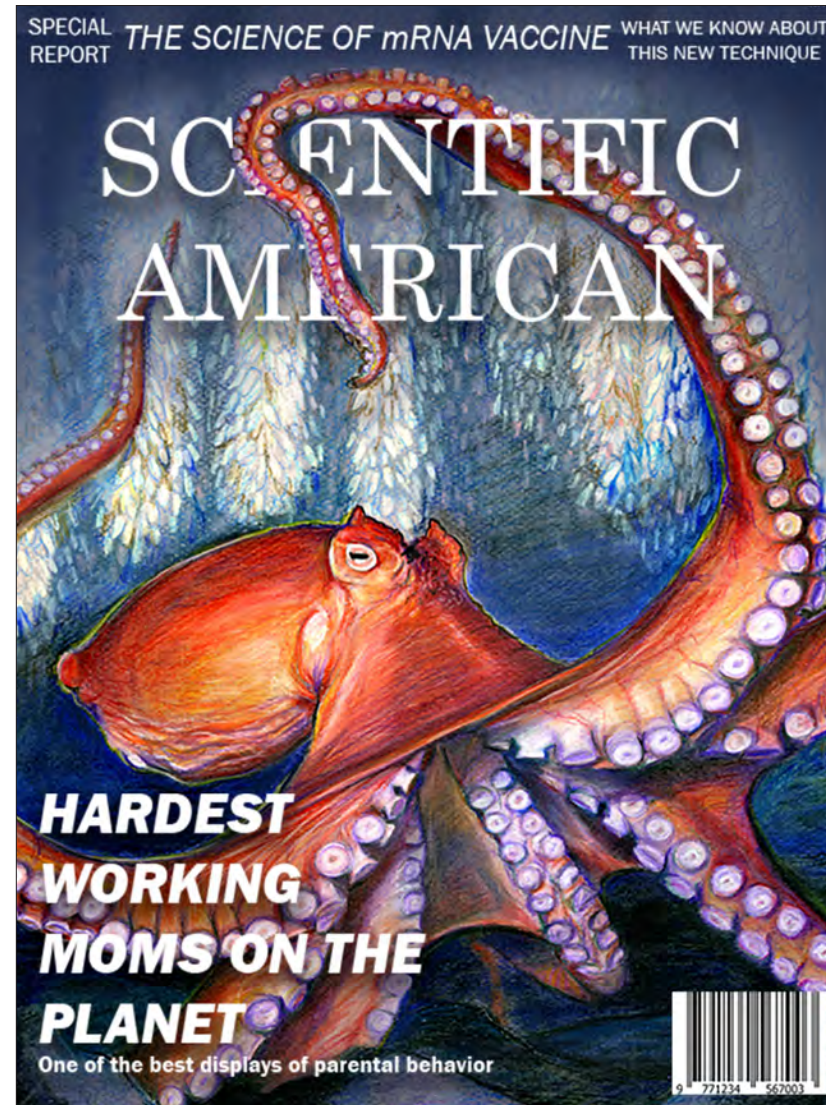
Chrysaora fuscescens
Pacific Sea Nettle Jellyfish

Class: Scyphozoa
Order: Semaestomeae
Family: Pelagiidae
Size: Up to 50cm in diameter
Habitat: Coast of Oregon and California

Sphingidae - *Manduca sexta* Tobacco Hornworm (Adult)



Genus: Manduca
Family: Sphingidae
Species: Sexta
Order: Coleoptera
Origin: Southern Canada, United States esp. the Gulf Coast, Central and South America



The Giant Pacific Octopus
 Leeza Duller 2020
 10" x 8" Colored Pencil

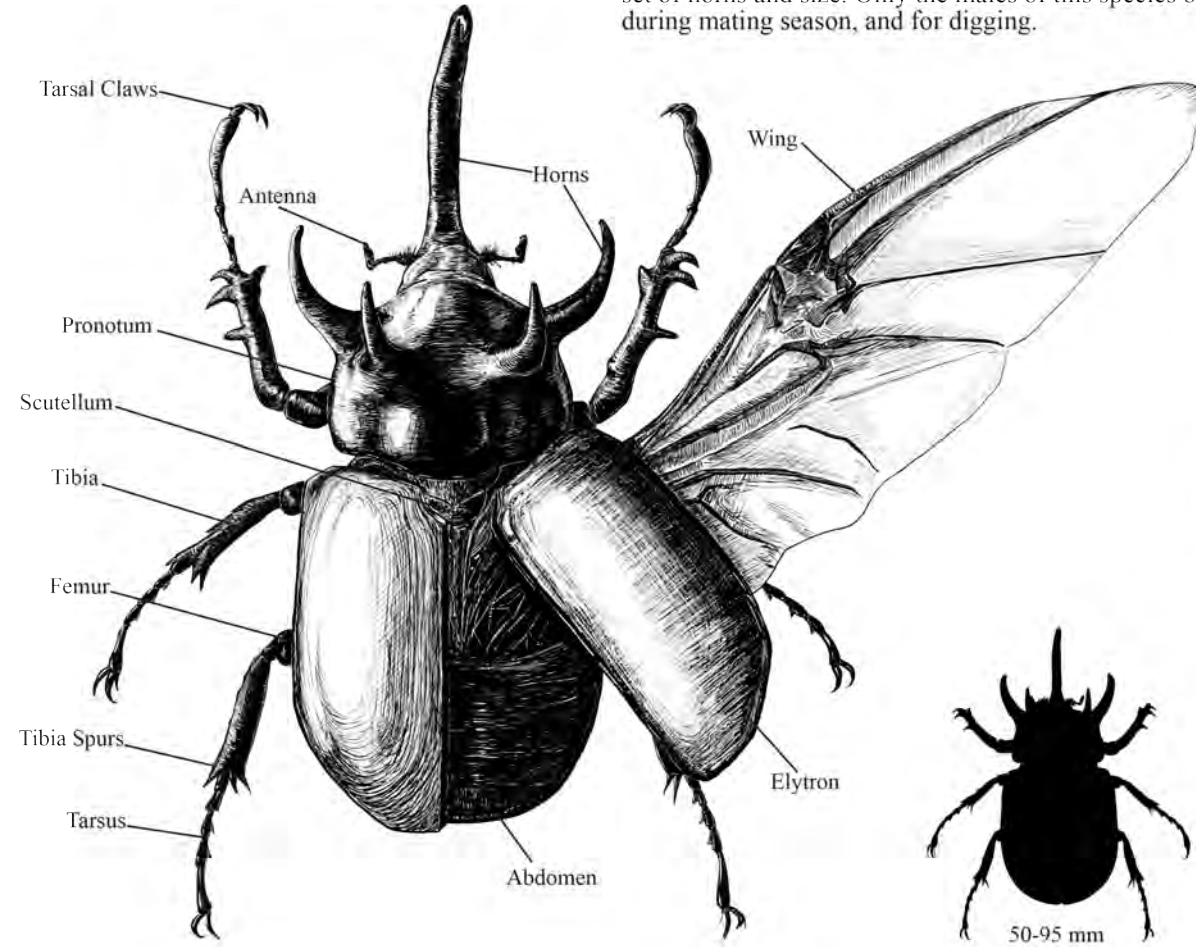


Bizarre Blooms
 Isabel Dory 2021
 8" x 10" Colored Pencil, Digital Media

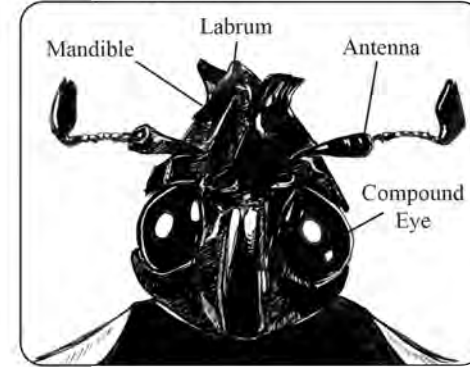
Eupatorus gracilicornis

The Five-Horned Rhinoceros Beetle

The Five-Horned Rhinoceros Beetle can be found in China, India, Myanmar, Thailand, Laos and Vietnam. It is part of the subfamily, Dynastinae or Rhinoceros Beetles and is known for its unique set of horns and size. Only the males of this species bear horns that they use to fight other males during mating season, and for digging.



Ventral closeup of the head



Class: Insecta
Order: Coleoptera
Family: Scarabaeidae



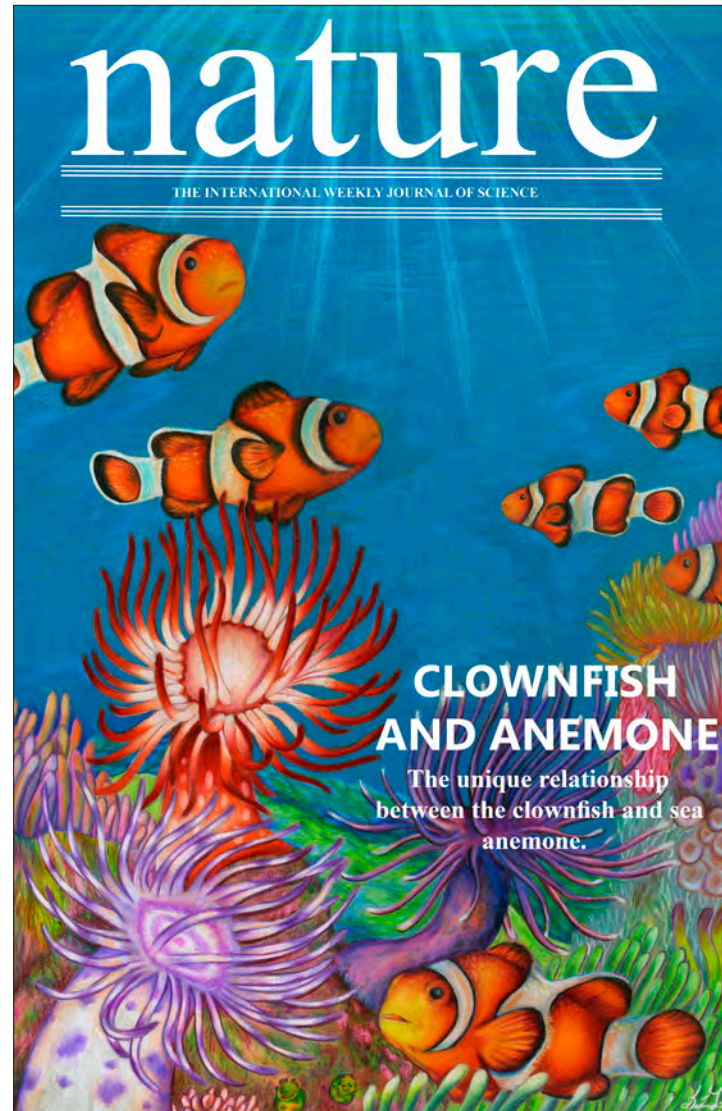
The Five Horned Rhinoceros Beetle

Leeza Duller 2020
10" x 8" Pen and Ink



Bugs Don't Lie

Leeza Duller 2021
12" x 9" Digital Media



Clownfish Nature Journal
Diana Lahr 2020
10" x 8" Colored Pencil, Digital Media

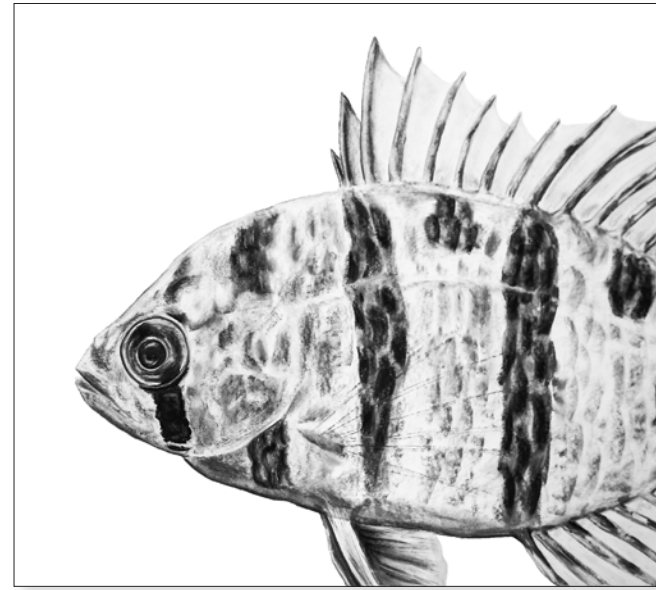
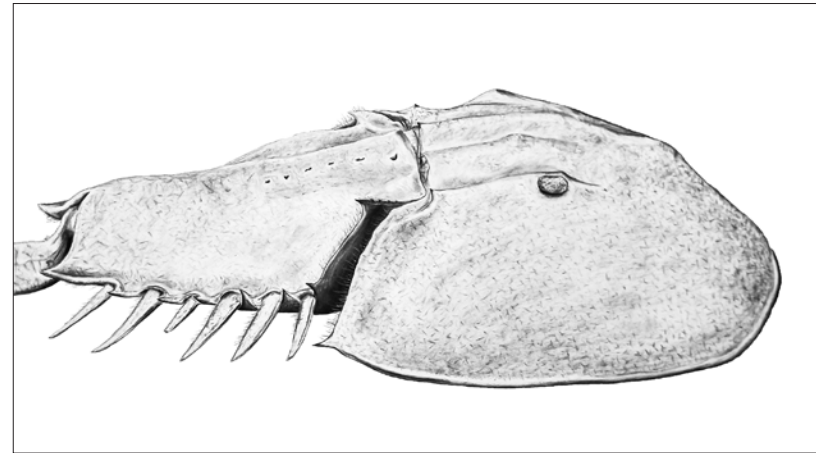
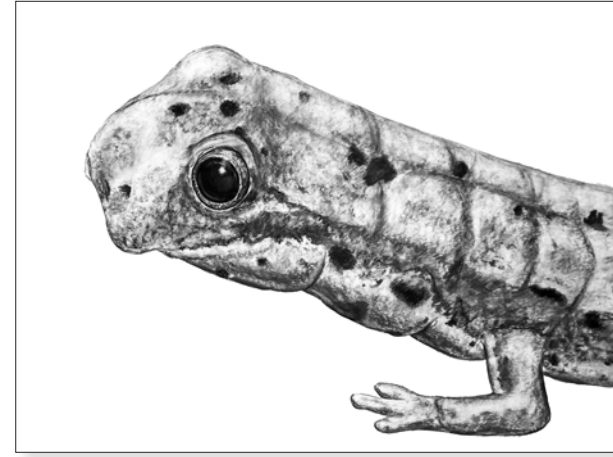
JUST STICKING AROUND



Hop over to the Philadelphia Zoo

Friday, April 24, 2020
2:00 – 6:00pm

Just Sticking Around
Alex Resnik 2020
10" x 12" Carbon Dust, Digital Media



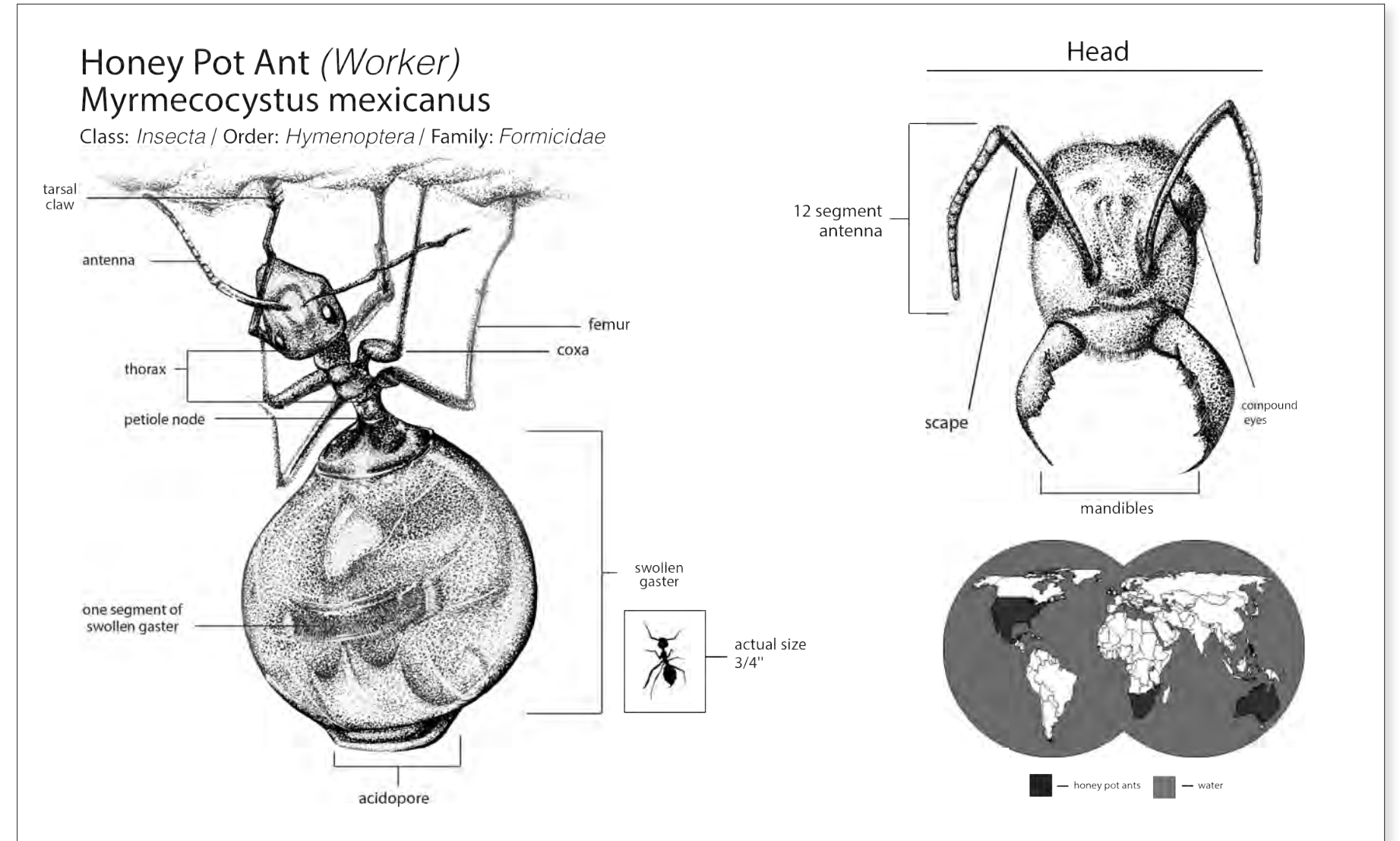
*New Jersey Species
Plate Series*
Emerson Harman 2021
30" x 40" Charcoal, Graphite



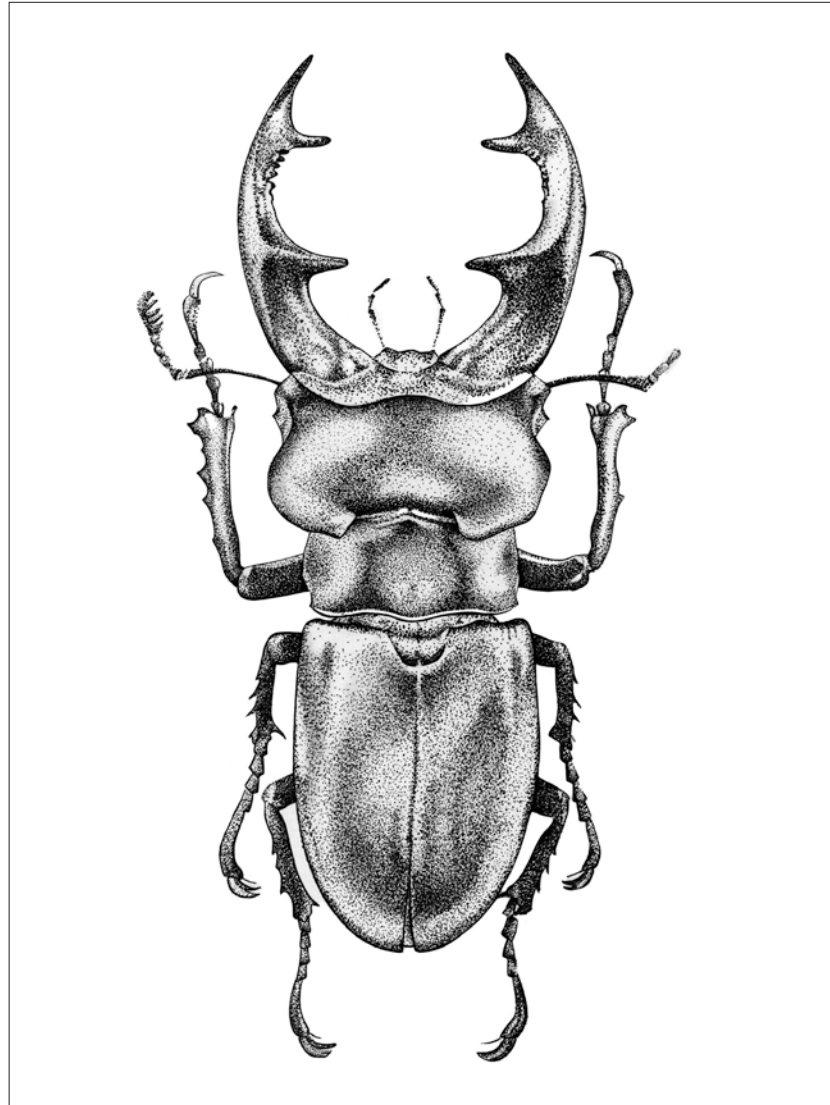
American Burying Beetle
Emerson Harman 2020
12" x 9" Pen and Ink



Aurelia aurita in Blue
Shannon Kannak 2019
10" x 8" Colored Pencil, Digital Media



Myrmecocystus mexicanus
Shannon Kanak 2020
10" x 13" Pen and Ink



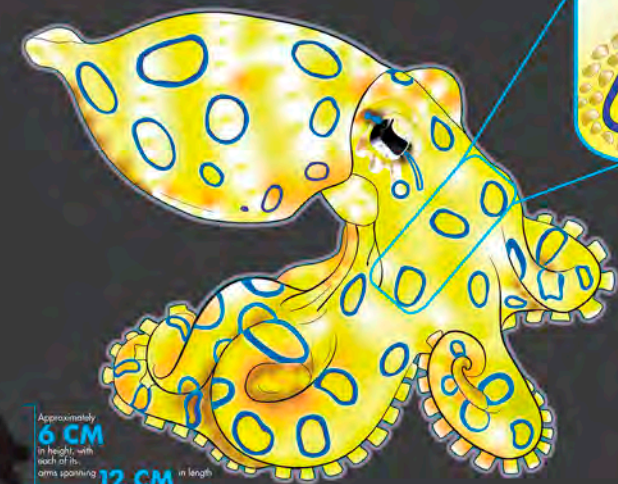
Stippled Stag Beetle
Douglas Jones 2020
8" x 6" Pen and Ink



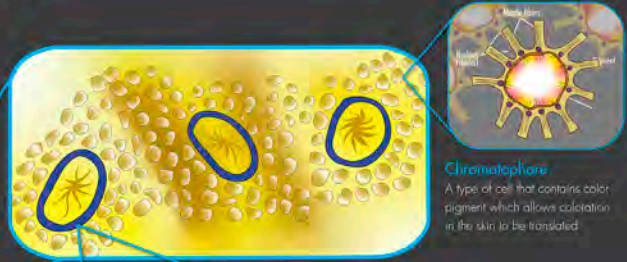
Angelfish Hellscape
Douglas Jones 2020
10" x 8" Colored Pencil, Digital Media

The Greater Blue-Ringed Octopus

Hapalochlaena lunulata



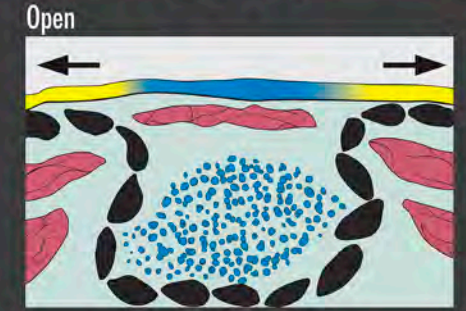
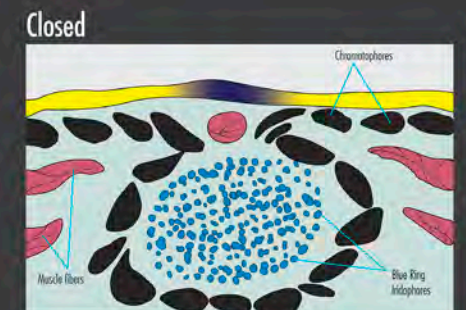
Approximately **6 CM** in height, with each of its arms spanning **12 CM** in length.



Chromatophore
A type of cell that contains color pigment which allows coloration in the skin to be translated.



Iridophore
A type of chromatophore cell that reflects light to create iridescent colors through nanosized crystal light refraction.



Tiny but venomously deadly!
These octopi's salivary glands produce tetrodotoxin (TTX) which is potentially neurotoxic and has the ability to block nerve impulse transmissions. This can stop muscle contraction and lead to deathly consequences for the ingester.

So How Exactly Do They Glow?

The Flashing Mechanism of The Blue-Ring Octopus

In addition to their venomous defense and ability to flawlessly camouflage, when feeling incredibly threatened or in danger these octopi will relax their muscles to uncover the blue-ring iridophores. Specifically, muscles outside of the blue rings contract while muscles over the blue rings iridophores relax.

By doing so, this exposes iridescence, as seen on the bottom right image, which create a neon blue glow. In contrast, the contraction of transverse muscles cover up the blue-ring iridophores, which, in turn, covers iridescence as seen on the top image. The iridophores create this effect through reflections.

The Blue-Ringed Octopus
Sofia Monaco 2020
10" x 12" Digital Media

BROWN PELICAN

Pelecanus occidentalis

The brown pelican is one of three pelican species found in the Americas and one of two that feed by diving into the water. The brown pelican mainly feeds on fish, but occasionally eats amphibians, crustaceans, and the eggs of other birds.

They nest in colonies in secluded areas, such as islands and mangroves. Females usually lay 2 or 3 eggs, which take around 30 days to hatch. After 9 weeks juveniles leave the nest.



Habitat Range
North and South American Coasts



Breeding adults have the signature brown, glossy coat.

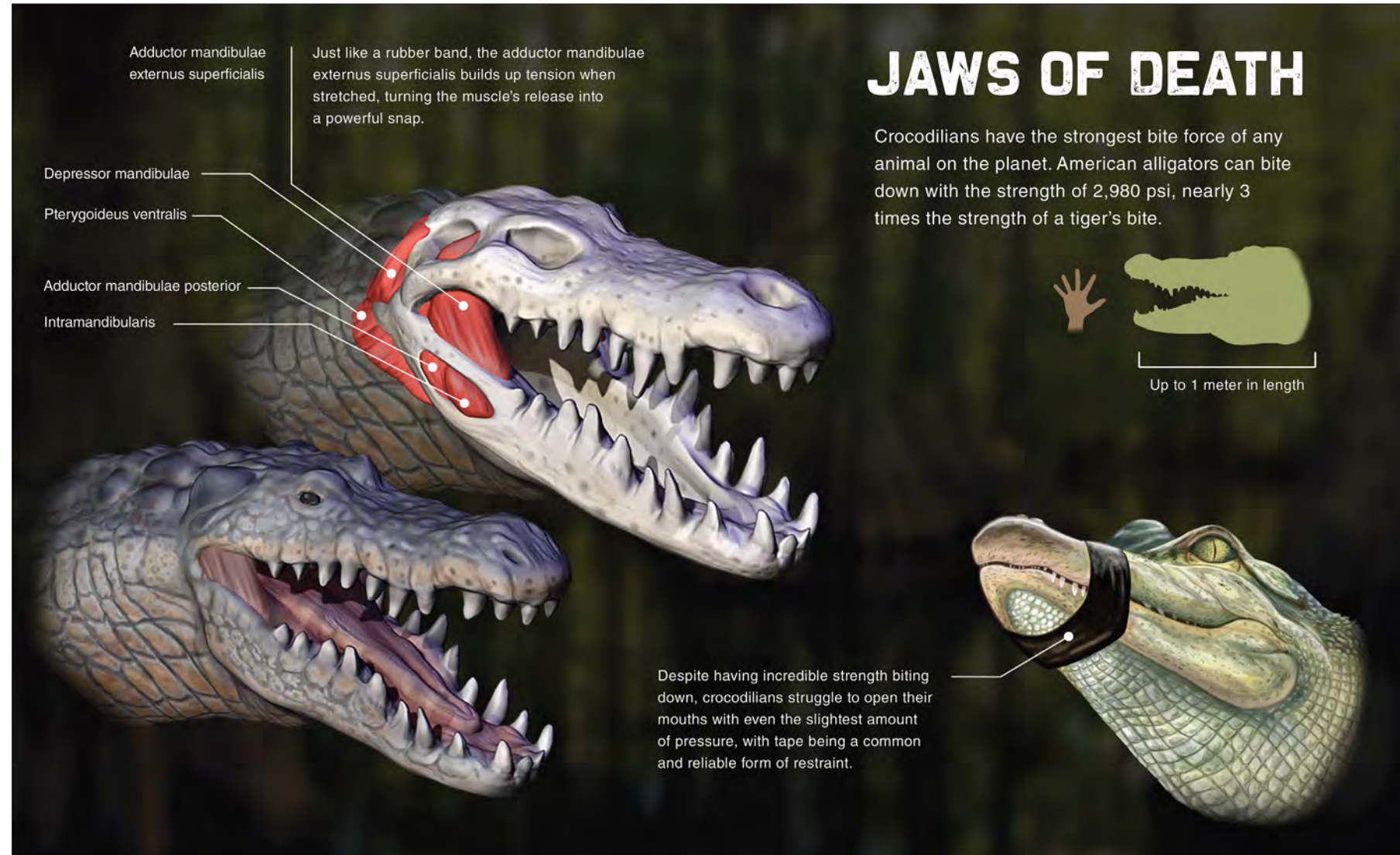
Brown Pelican
Allison Mosley 2021
10" x 10" Digital Media



Common Ball Python Color Morphs
Allison Mosley 2021
24" x 18" Digital Media



Eastern Long Neck Turtle
Allison Mosley 2021
10" x 14" Digital Media



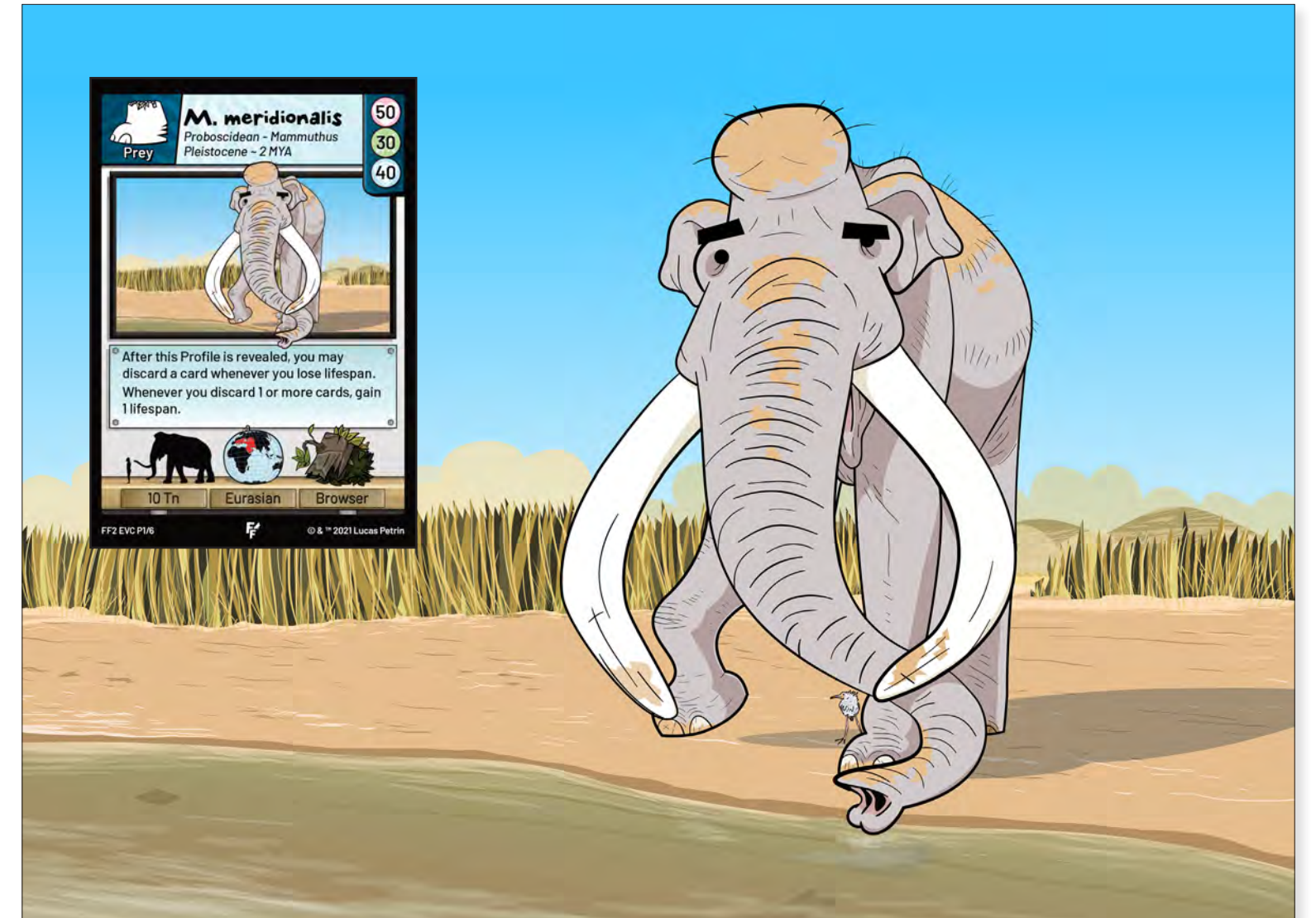
Jaws of Death
Allison Mosley 2021
10" x 12" Digital Media



Great Horned Owl
Allison Mosley 2021
18" x 12" Digital Media



Mastodon
Lucas Petrin 2019
10" x 20" Watercolor and Digital Media



Mert (Fossil Fracas Card Game)
Lucas Petrin 2020
10" x 12" Digital Media



Aurelia aurita in Blue
Lilly Smith 2019
10" x 8" Colored Pencil, Digital Media

DILATED CARDIOMYOPATHY IN DOGS

What is DCM?
Dilated Cardiomyopathy in dogs is a disease of the heart that is associated with cardiac dysfunction, arrhythmia, and congestive heart failure. The disease involves the spherical dilation and impaired contraction of the left ventricle with enlargement of the left atrium. The variability of the effects of DCM result in difficulties with identifying the disease early on. It can be broken into a clinical stage that results in either cardiac arrhythmia, heart failure, or euthanasia, and a preclinical stage which is when it is very difficult to recognize. The preclinical stage is important for breeds that are genetically predisposed to being diagnosed with DCM, including larger dogs and those with familial risk.

General stages of heart disease in dogs:

Stage A high risk dogs/ genetically pre- disposed	Stage B heart murmur, no visible signs of heart failure	Stage B1 heart murmur, no structural changes	Stage B2 heart murmur, structural changes	Stage C heart failure evident, needs treatment	Stage D heart not responding to treatment
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Causes:

- Nutrition/diet: possible correlation with vitamin deficiencies or toxins related to food
- Genetic predisposition (heritable): Larger dog breeds and those with familial risk have a higher chance of being diagnosed with DCM.

Most common breeds: Boxer, Doberman Pinscher, Great Dane, Saint Bernard, German Shepherd, Irish wolfhound, Portuguese Water Dog, American Cocker Spaniel, Golden Retriever, Newfoundland.

Diagnosis:
DCM usually becomes apparent in dogs in the occult or preclinical phase when there is decreased cardiac pump function or heart arrhythmias. It is possible that during the preclinical phase, there are no clinical signs and there is a possibility of sudden death before DCM can be spotted. In the clinical phase, it becomes apparent through clinical signs including a gradual enlargement of the left atrium of the heart. Diagnosis of DCM is best done through echocardiography, which only takes a few minutes to show if there is a DCM phenotype and is best in excluding other heart diseases that might be present.

Symptoms:

- lethargy
- weakness
- weight loss
- irregular/weak pulse
- heart murmur
- decreased exercise
- coughing
- abdominal pain
- panting

Treatment & Prognosis:
There is no cure or treatment for DCM that will remove the effects, however there are medications available that can improve heart function and reduce circulatory congestion. Survival rates vary depending on different factors such as dog breed and size. It might be slowly progressive in some breeds which would allow for a few months or up to a few years of life after the diagnosis. However, sudden death is possible in both the occult and clinical phases.

Normal heart

DCM Heart

Enlarged right ventricle
Enlarged left ventricle
Thinned wall

Attenuated Fiber Type:
seen in large breed dogs

Fatty Infiltration Degenerative Type:
seen mainly in Doberman Pinschers and Boxers

Katya Cyrulik 2021

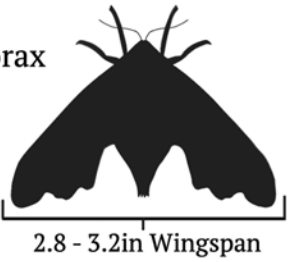
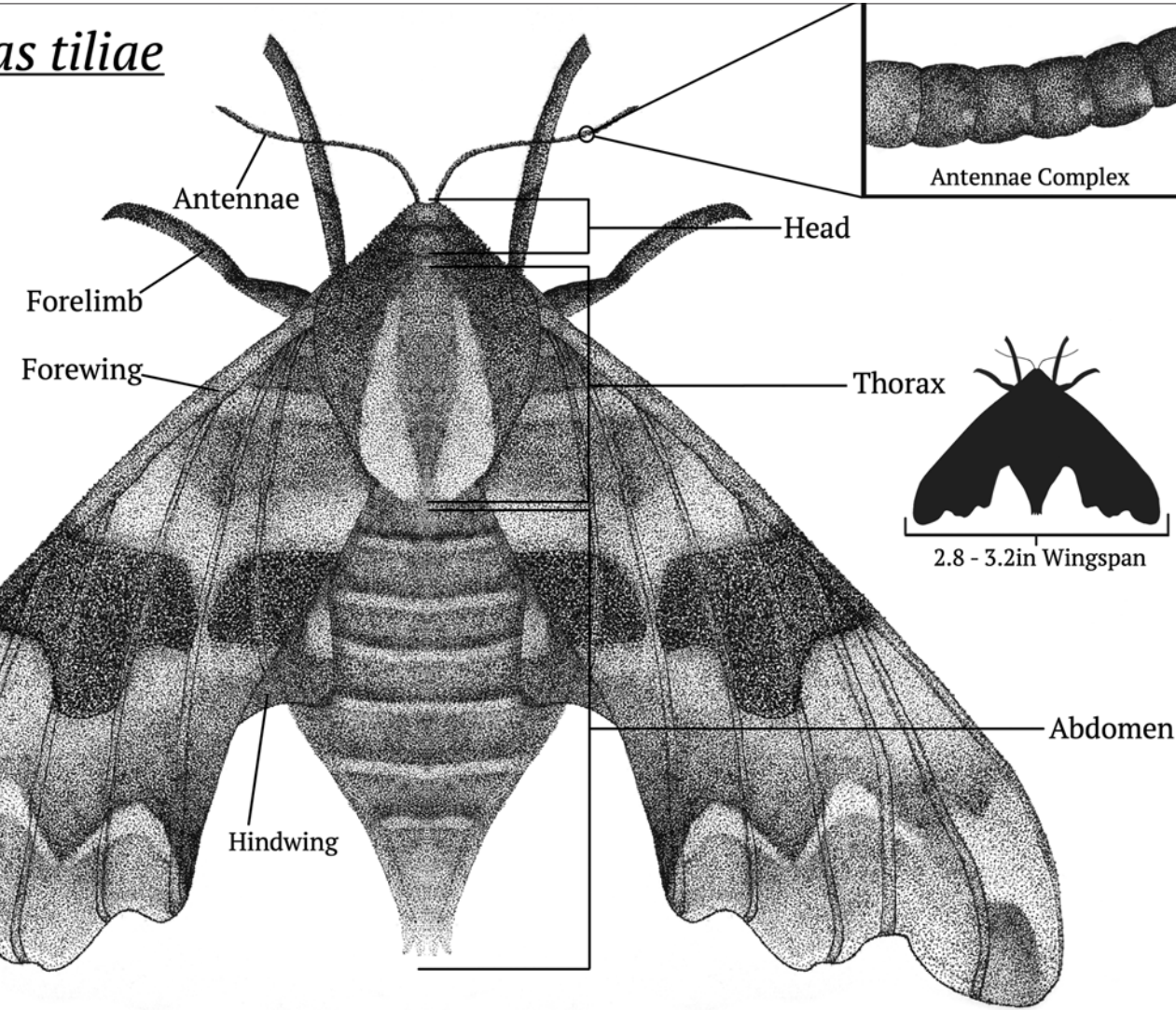
Dilated Cardiomyopathy in Dogs
Katya Cyrulik 2021
11" x 8.5" Digital Media

Sphingidae *Mimas tiliae*

~Lime Hawk Moth



~Geographic Location:
 England, Wales
 ~Class - Insecta
 ~Order - Lepidoptera
 ~Family - Sphingidae



Sphingidae Mimas tiliae
 Naman Srivastava 2019
 10" x 12" Pen and Ink, Digital Media

Orchid mantis *Hymenopus coronatus*

Orchid mantises are truly masters of camouflage. Not only do they mimic flowers to seek protection from potential predators—they also employ it to capture bigger prey. Using camouflage both offensively and defensively shows true skill in their craft.

Habitat
 Orchid mantises predominantly reside in Myanmar, Indonesia, Thailand, and Malaysia where they thrive in a tropical rainforest climate. Since they can turn themselves into orchid flowers, they don't necessarily require them to be in their habitat. By camouflaging themselves from prey they're able to create their own hunting grounds.

Ferociously Tiny With a Large Appetite
 Their carnivorous diet is made up of insects such as fruit flies, bees, crickets, and beetles. However, in some instances they may also consume small lizards, turtles, birds, mice, or frogs. Whatever they get their pincers on, expect it to be eaten at once!

A Colorful Variety

In addition to the regular green praying mantis, orchid mantises can vary in color between the typical pink and more white-ish yellow.

In contrast, newborn mantises appear a darker red with their arms and legs appearing black.

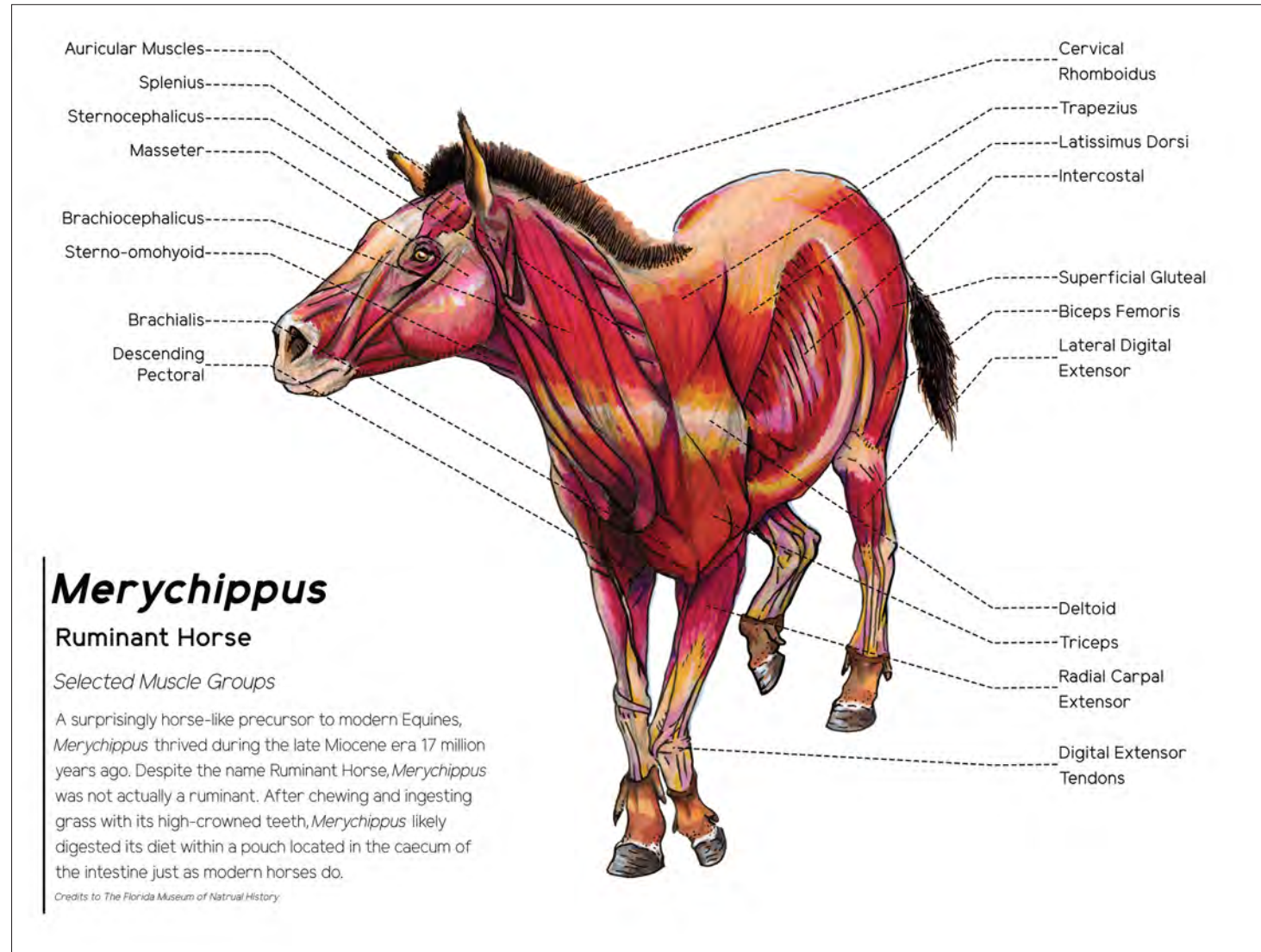
Classification

Kingdom	Animalia
Phylum	Arthropoda
Class	Insecta
Order	Mantodea
Family	Hymenopodidae
Genus	Hymenopus
Species	coronatus

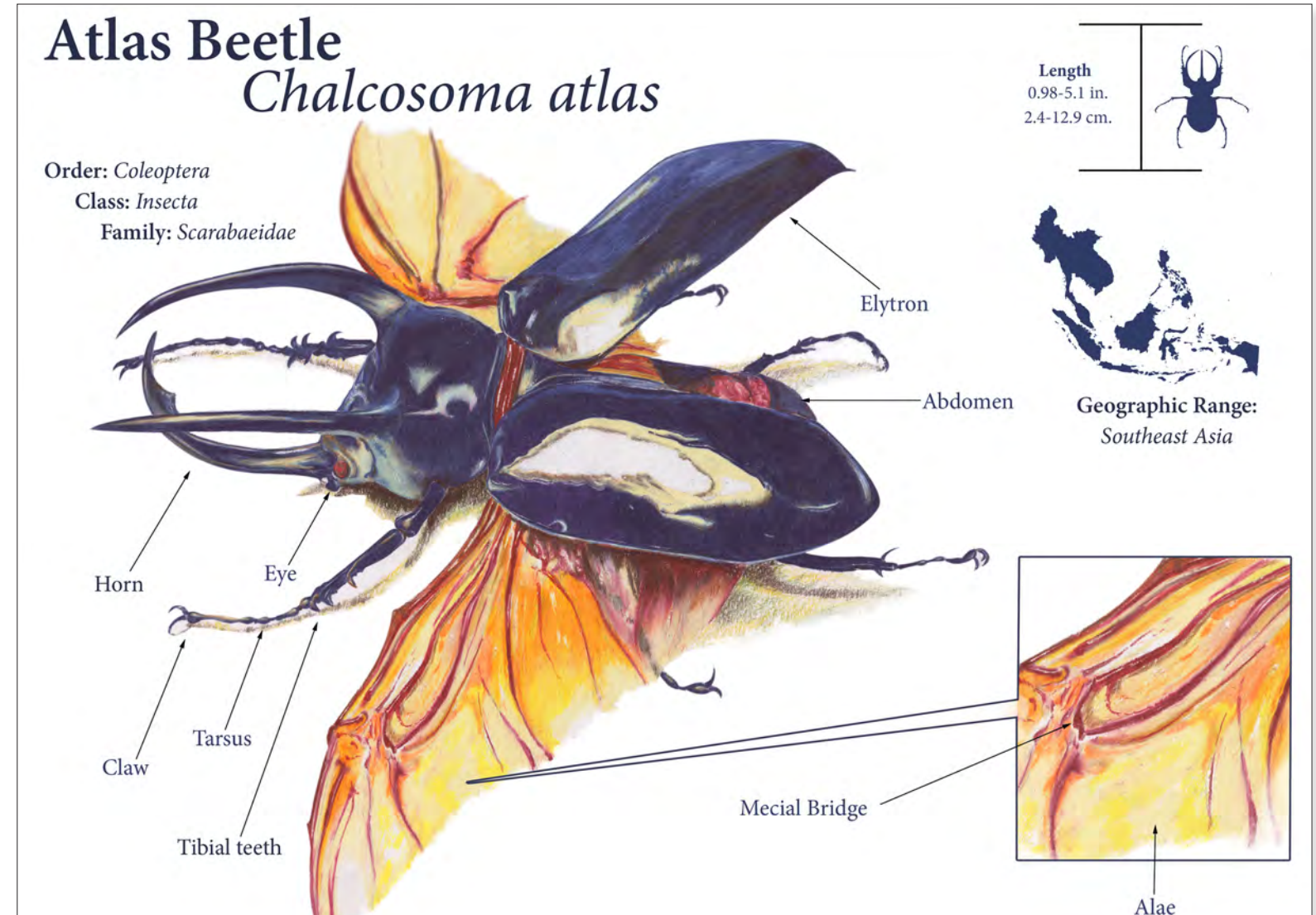
Approx. 3 in. tall

Female mantises can measure up to approximately 3 inches in size while males can be as small as half the size of the female.

Orchid Mantis
 Sofia Monaco 2022
 30" x 40" Digital Media



Merychippus (Ruminant Horse)
Lucas Petrin 2020
12" x 16" Watercolor, Digital Media



Atlas Beetle
Isaiah Reese 2019
10" x 12" Colored Pencil, Digital Media

American Lobster

Homarus americanus

American lobsters are the largest extant species of arthropod in the entire world.

American lobsters have an incredibly long life span, living up to 50 years old if they can evade being captured for human consumption.

Geographic range
Atlantic coast of North America

Rare color morphs

Pain and Suffering
When lobsters are prepared for human consumption, they are often boiled alive. Although this is the traditional method of slaughter, researchers at Queen's University Belfast determined that crustaceans could remember and react to irritants.

Researchers experimented on a variety of crustaceans utilizing mild irritants. When exposed to weak acid, prawns would rub and scratch the area it was applied. Hermit crabs would leave their otherwise comfy shells when exposed to an electrical shock.

Although the evidence is strong, we can never determine if lobsters (or any animals) can feel pain like we do. Despite this, we should strive to show compassion or all creatures, no matter how strange or unusual.

Bottom Feeder
Living on the rocky ocean floor, lobsters spend their nights roaming the ocean floor in search of food.

Lobsters eat a wide variety of prey including mollusks, echinoderms, and polychaetas.

American Lobster
Allison Mosley 2021
16" x 24" Digital Media

Conservation Programs

- **Ambassador Program**
Devils are placed in zoos to breed and act as species ambassadors
- **Annual Monitoring**
Watch and record changes in the wild population to develop new management strategies
- **Maria Island Project**
Healthy breeding populations placed on off shore island to protect healthy devils

Research

<https://www.tcgvet.cam.ac.uk/about/DFTD>

<https://dpiwve.tas.gov.au/wildlife-management/save-the-tasmanian-devil-program>

Tasmanian Devil Facial Cancer

Tasmanian Devil Facial Cancer
Allison Mosley 2021
16" x 24" Digital Media



Fine Art (of Science) Illustration

After a certain high level of technical skill is achieved, science and art tend to coalesce in esthetics, plasticity, and form. The greatest scientists are always artists as well.

— Guild of Natural Science Illustrators



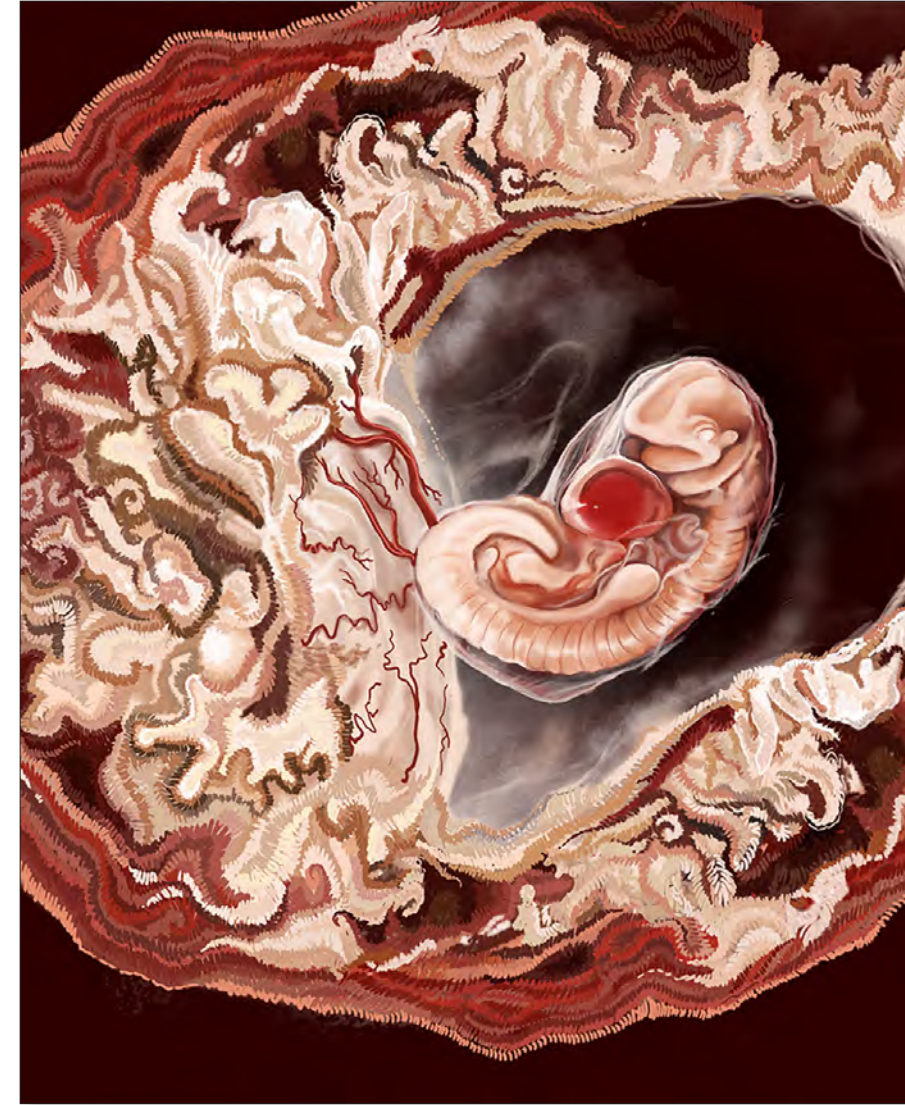
Still Life
Veronica Cava 2020
24" x 18" Digital Media



SACI Figure Anatomy Study
Jessica Angelini 2020
24" x 18" Fresco Painting



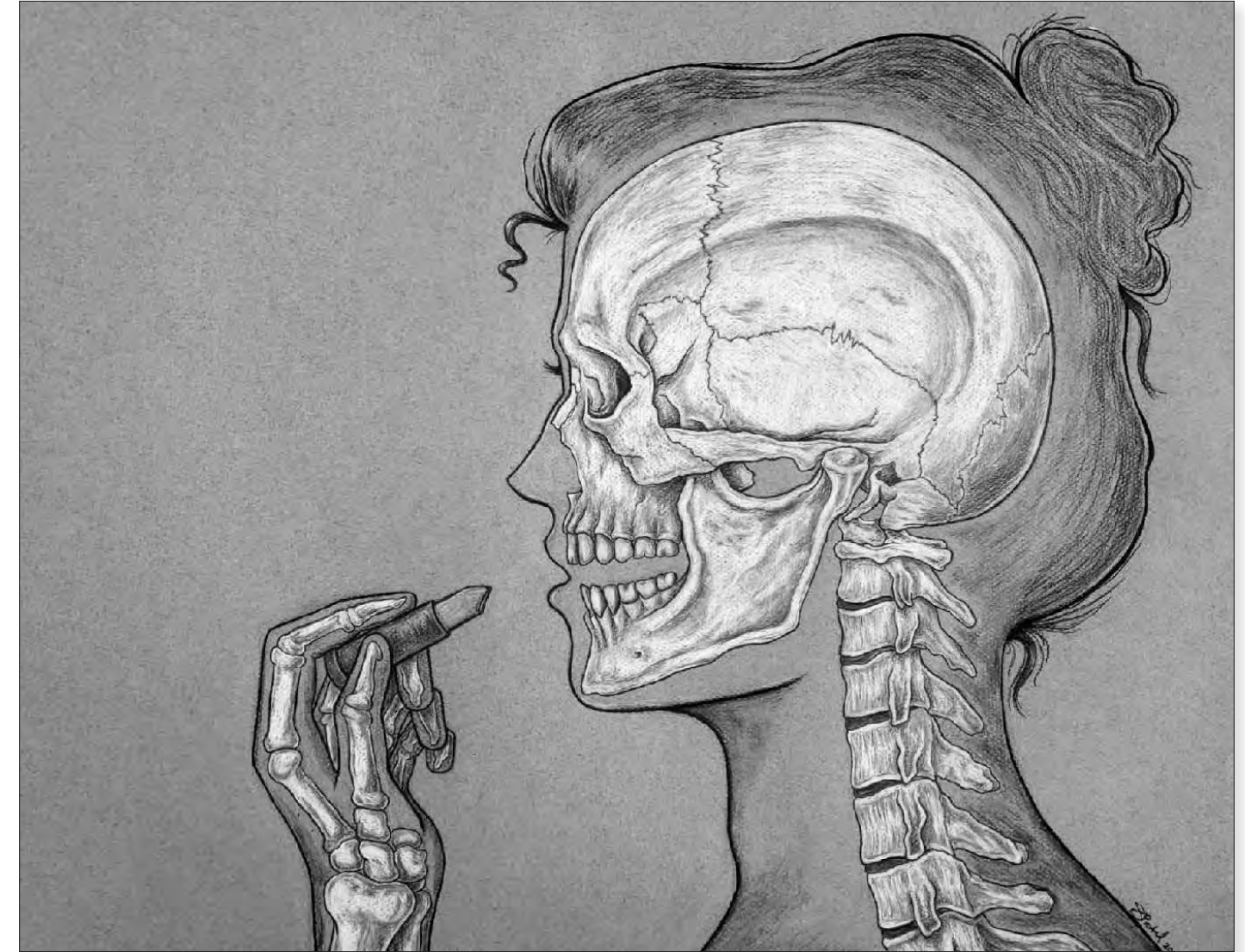
20 Week Human Fetus
Paxton Allen 2020
60" x 42" Digital Media



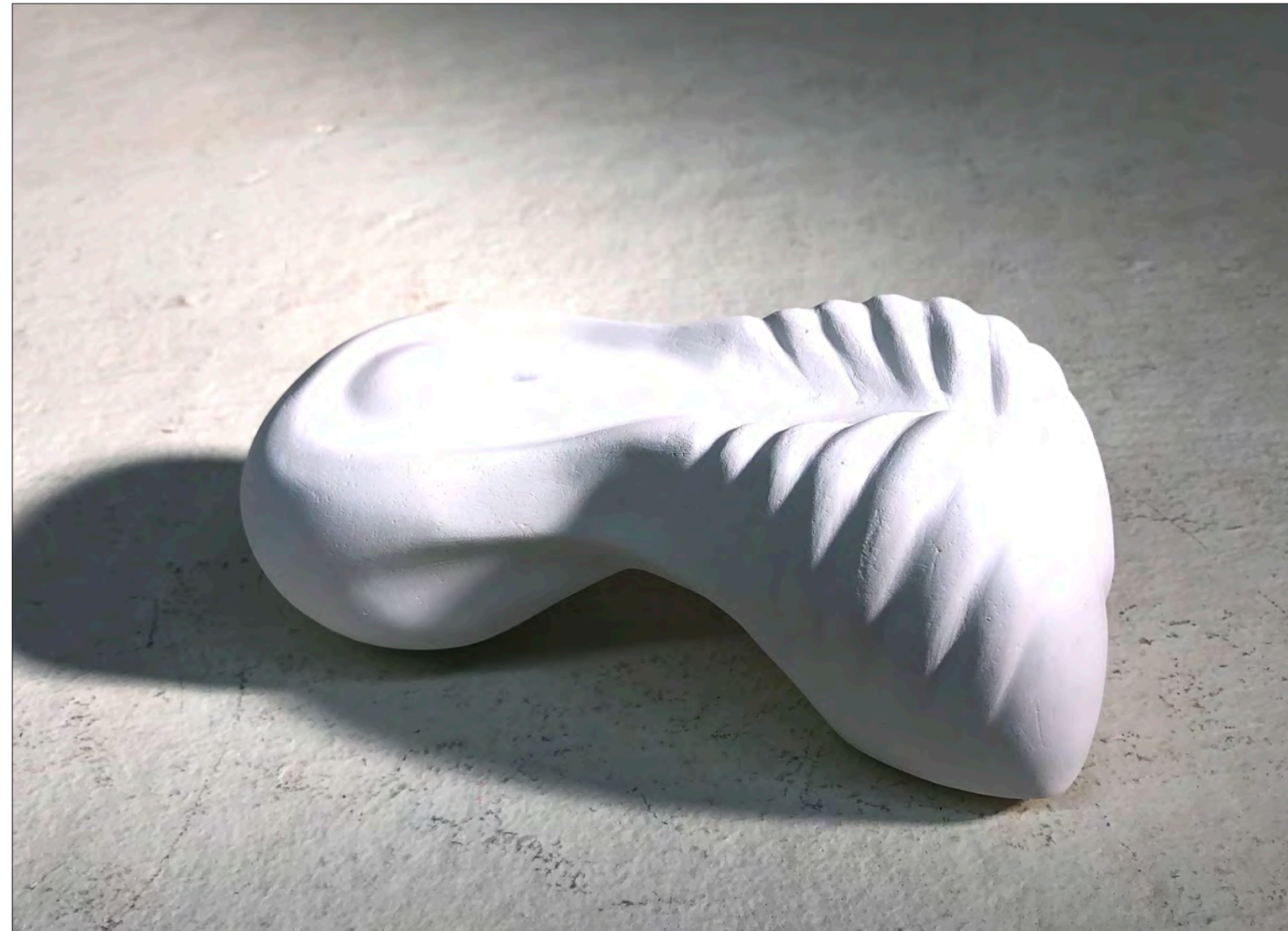
5 Week Human Fetus
Paxton Allen 2020
42" x 30" Digital Media



Crucifixion
Christina Czajkowski 2019
24" x 18" Screen Print, Mixed Media



CMSRU Selective: Lipstick Skeleton
Shrina Patel 2019
18" x 24" Colored Pencil



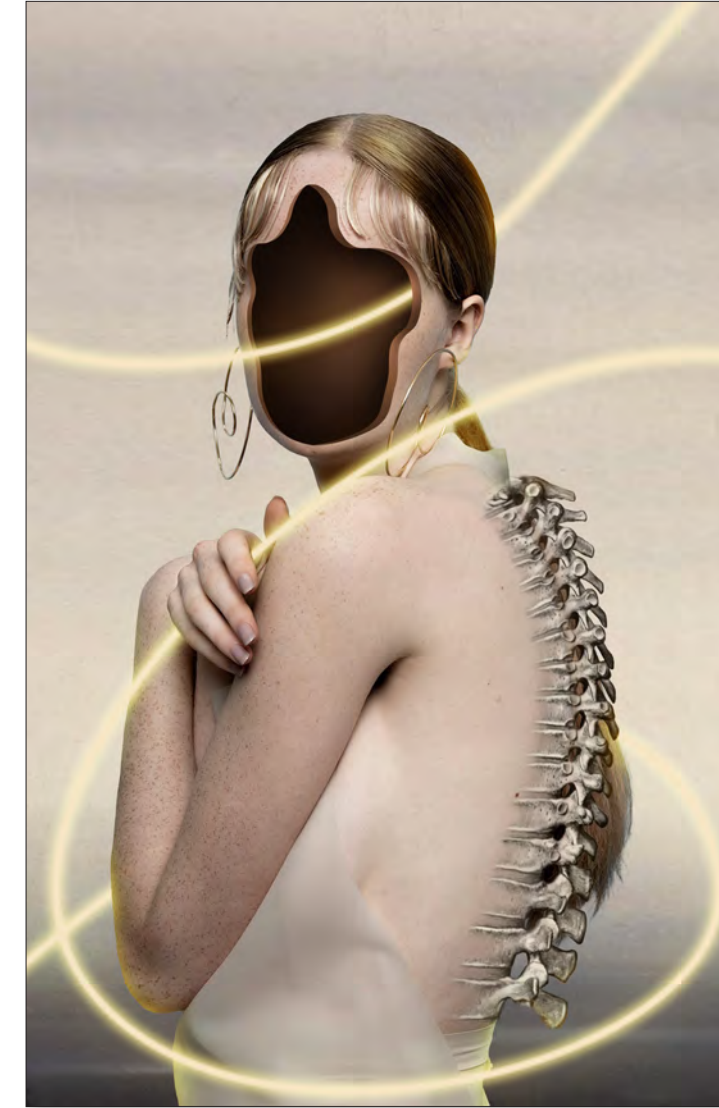
Ribs
Isabel Dory 2021
24" x 12" x 8" Plaster Sculpture



Untitled
Isabel Dory 2021
32" x 24" x 16" Metal Sculpture



Open Hands
Isabel Dory 2021
24" x 18" Mixed Media



Surreal Spine
Isabel Dory 2021
28" x 14" Digital Media



5 New Forms
Leeza Duller 2021
24" x 18" x 4" Plaster Sculpture



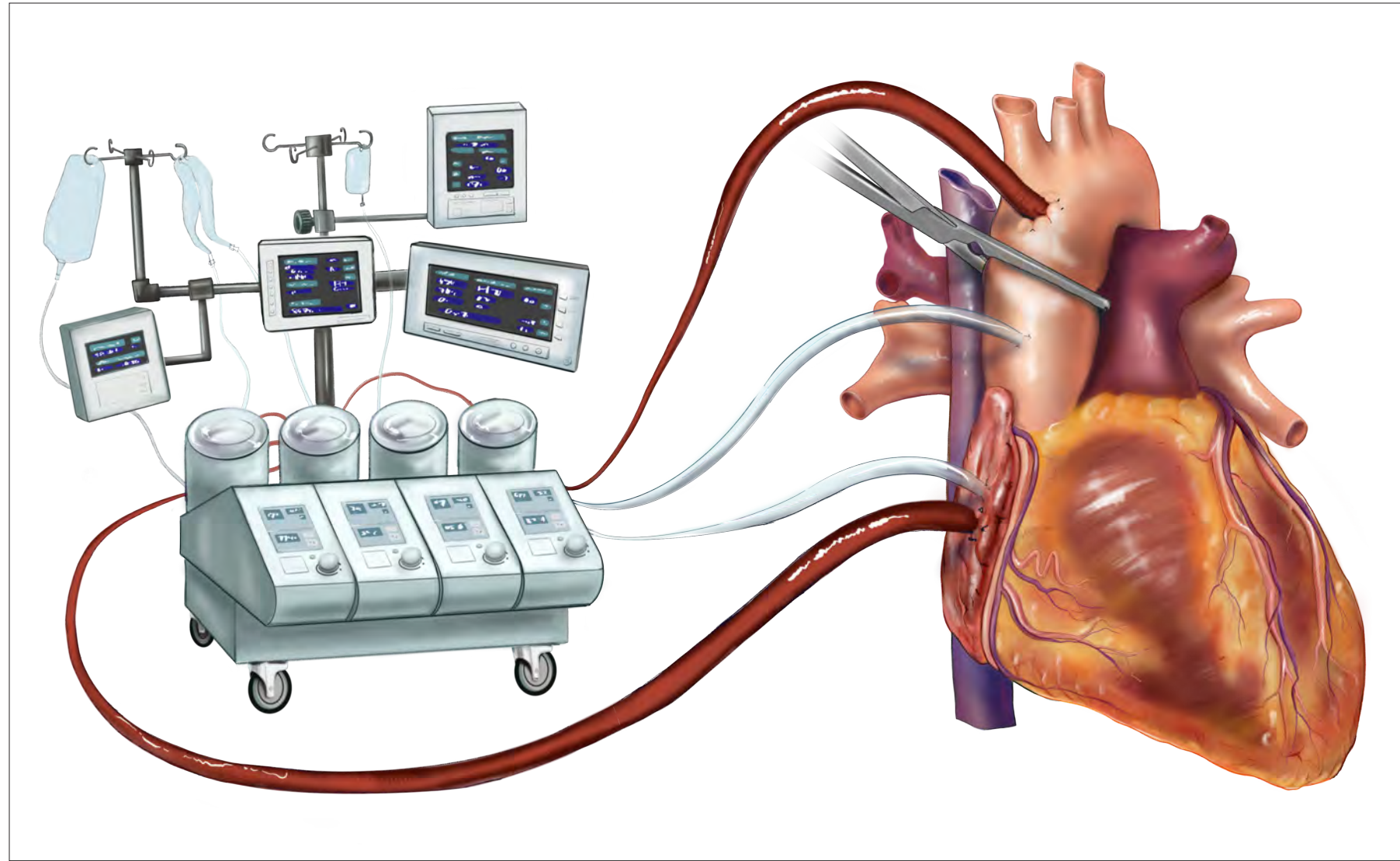
Large Landscape
Leeza Duller 2021
24" x 18" Mixed Media



Bird Tiles
Emerson Harman 2021
10" x 10" Graphite, Digital Media



Portrait Sketch
Leeza Duller 2021
10" x 10" Charcoal, Graphite



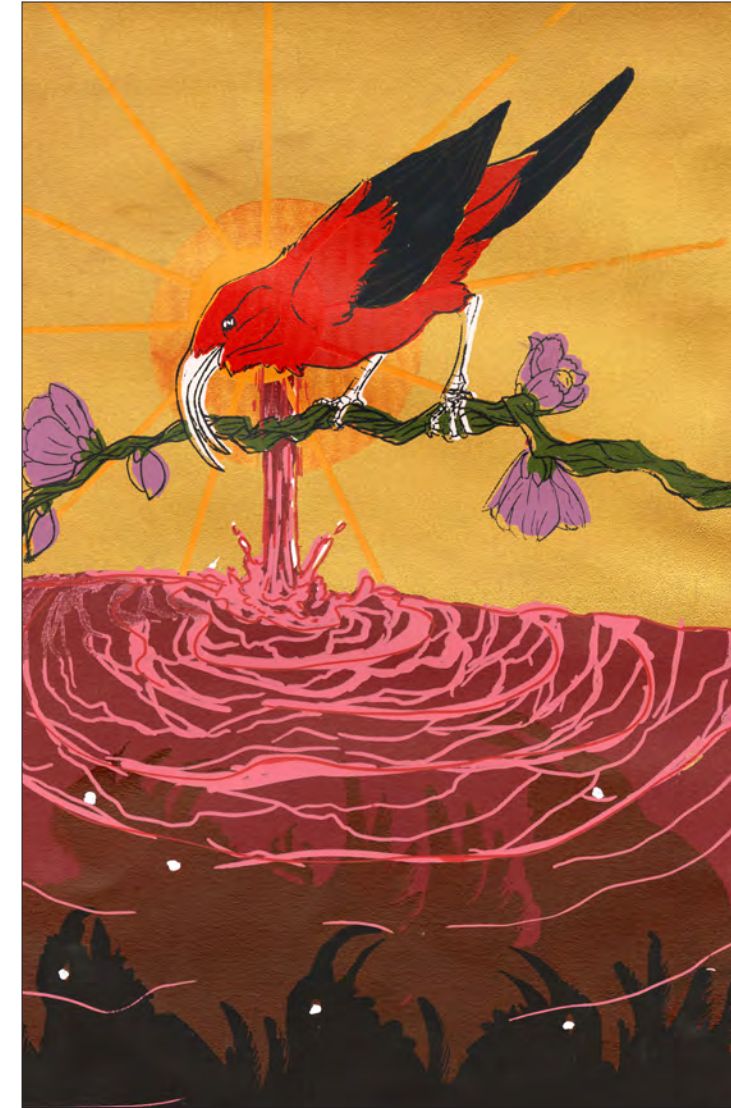
Cardiac Bypass
Karlee D. Rogers 2020
12" x 18" Digital Painting



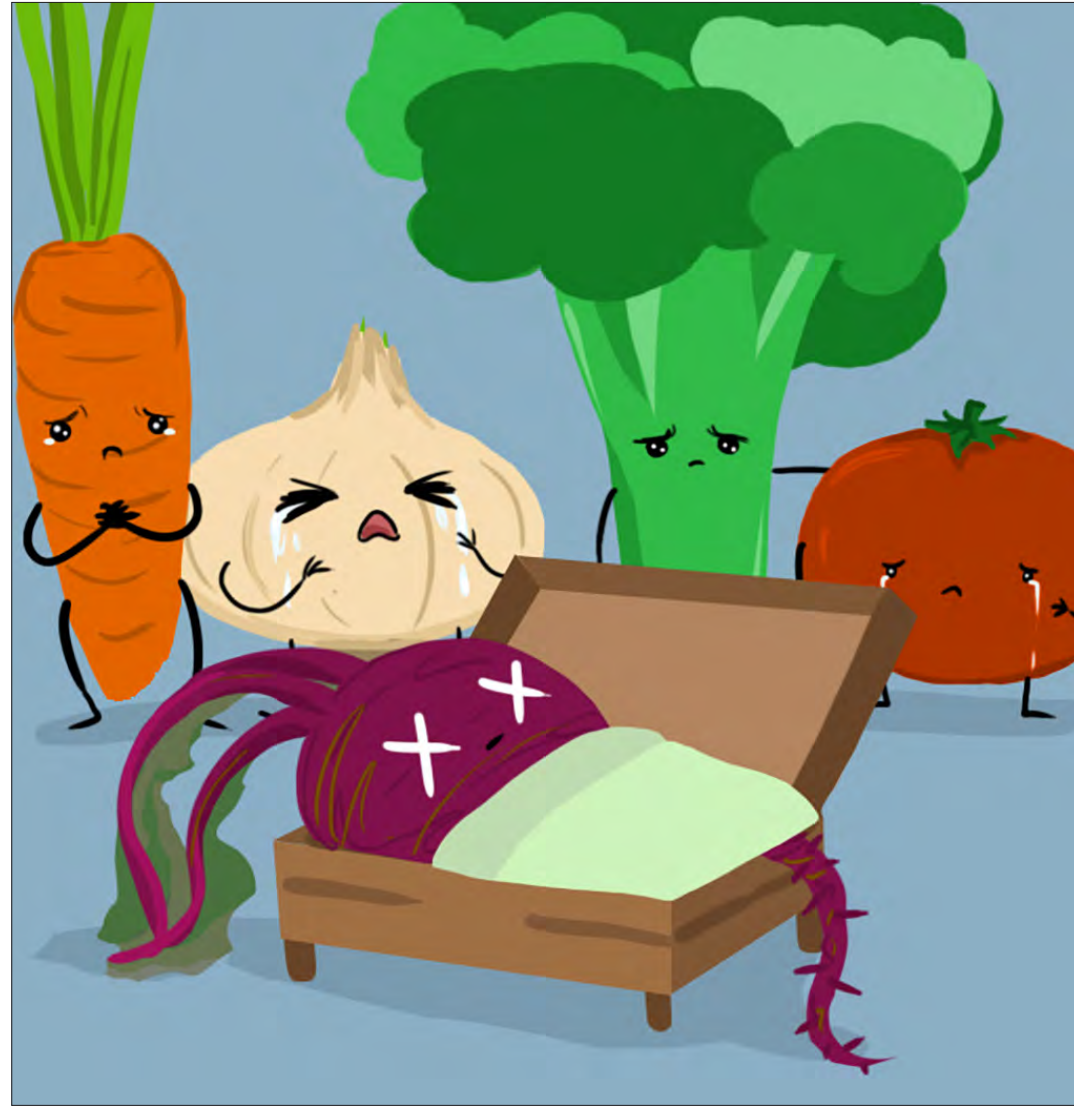
Skeletal Figure Study
Catherine Titterton 2021
24" x 16" Charcoal, Graphite



Still Life
Leeza Duller 2021
12" x 18" Digital Painting



Exsanguination
Christina Czajkowski 2019
24" x 18" Screen Print, Mixed Media



Visual Pun
Leeza Duller 2021
12" x 12" Digital Painting



Frida
Emerson Harman 2021
12" x 10" Digital Painting



Portrait of a Cat
Emerson Harman 2021
12" x 10" Digital Painting



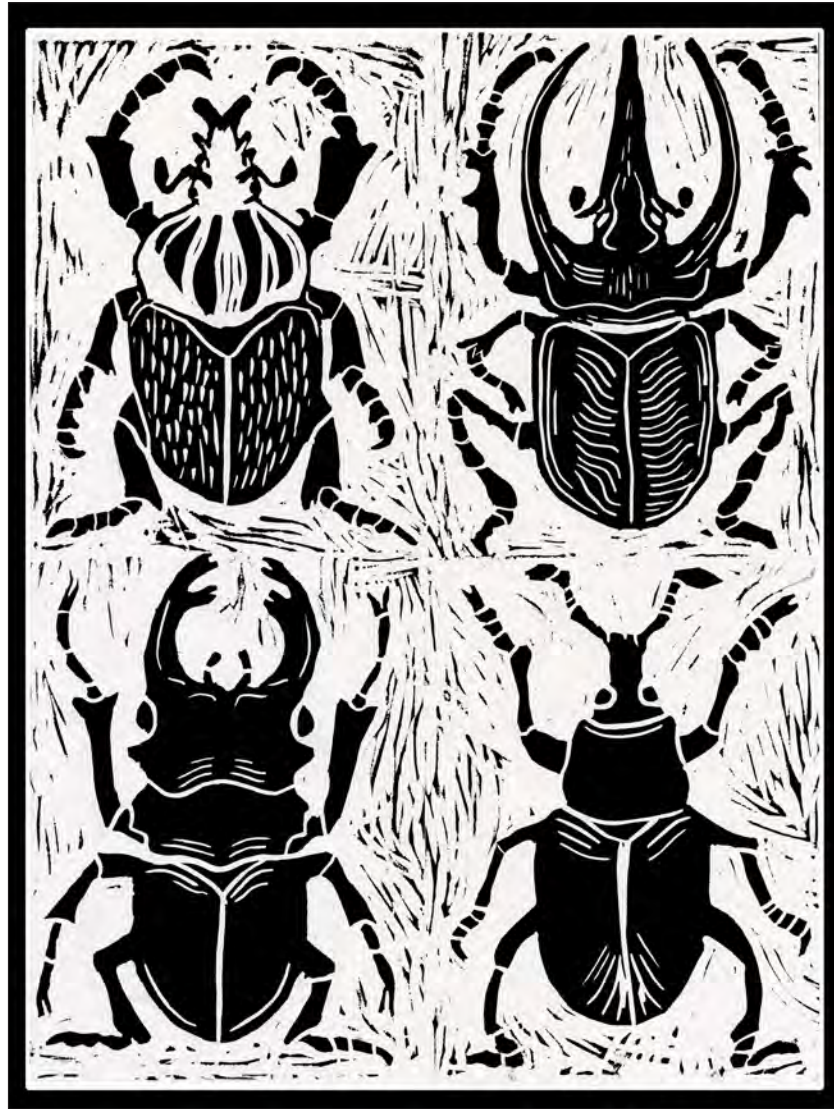
Peony
Emerson Harman 2021
12" x 10" Digital Painting



Still Life
Douglas Jones 2021
12" x 18" Digital Painting



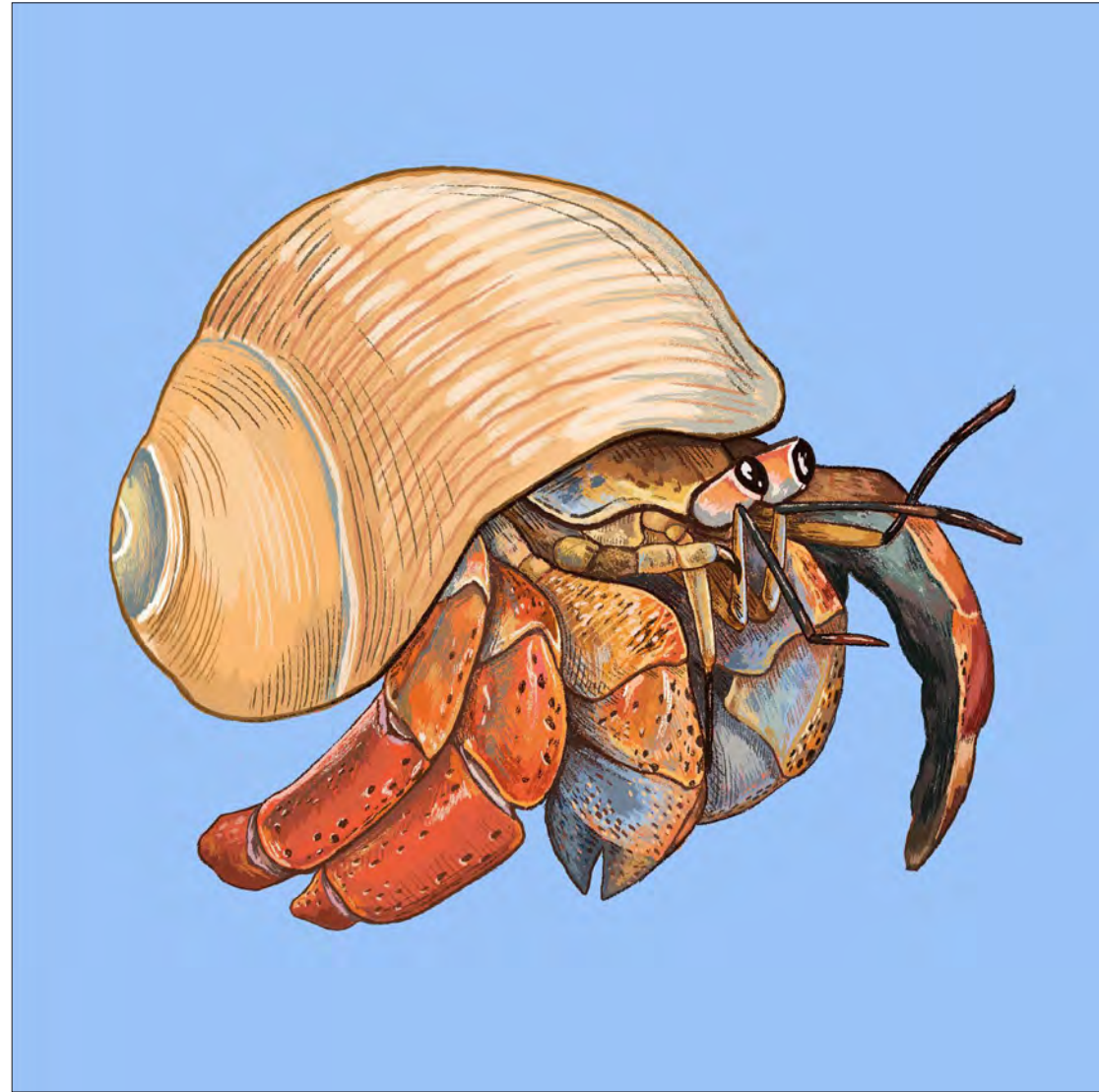
Still Life
Mariele Ford 2020
12" x 18" Digital Painting



Quad Beetle Prints
Allison Mosley 2021
12" x 18" Screen Print, Mixed Media



Still Life
Diana Lahr 2021
12" x 18" Digital Painting



Crab
Allison Mosley 2021
12" x 12" Digital Painting



Tiger
Allison Mosley 2021
12" x 12" Digital Painting



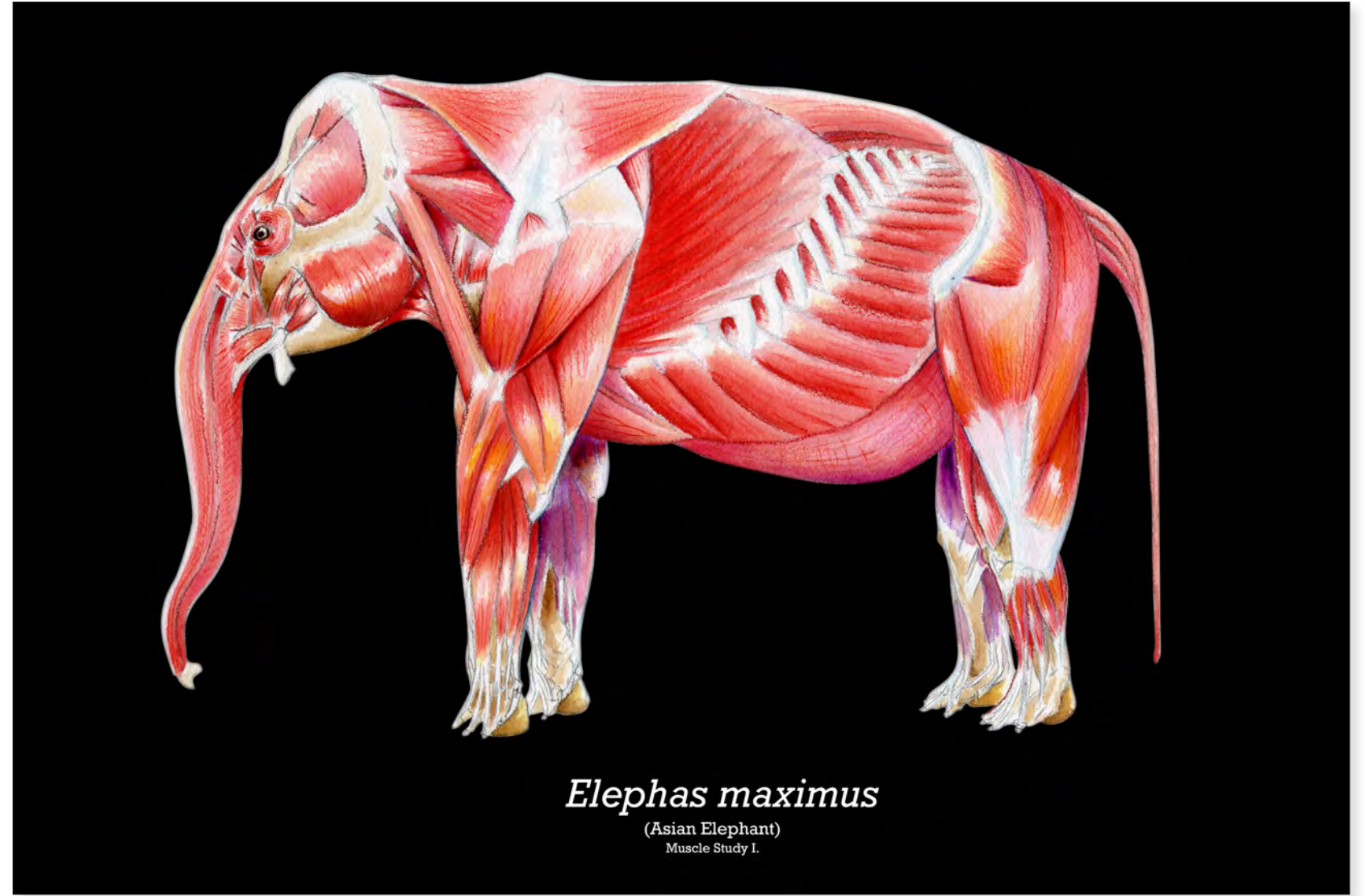
Chameleon
Karlee D. Rogers 2019
16" x 12" Colored Pencil, Digital Media



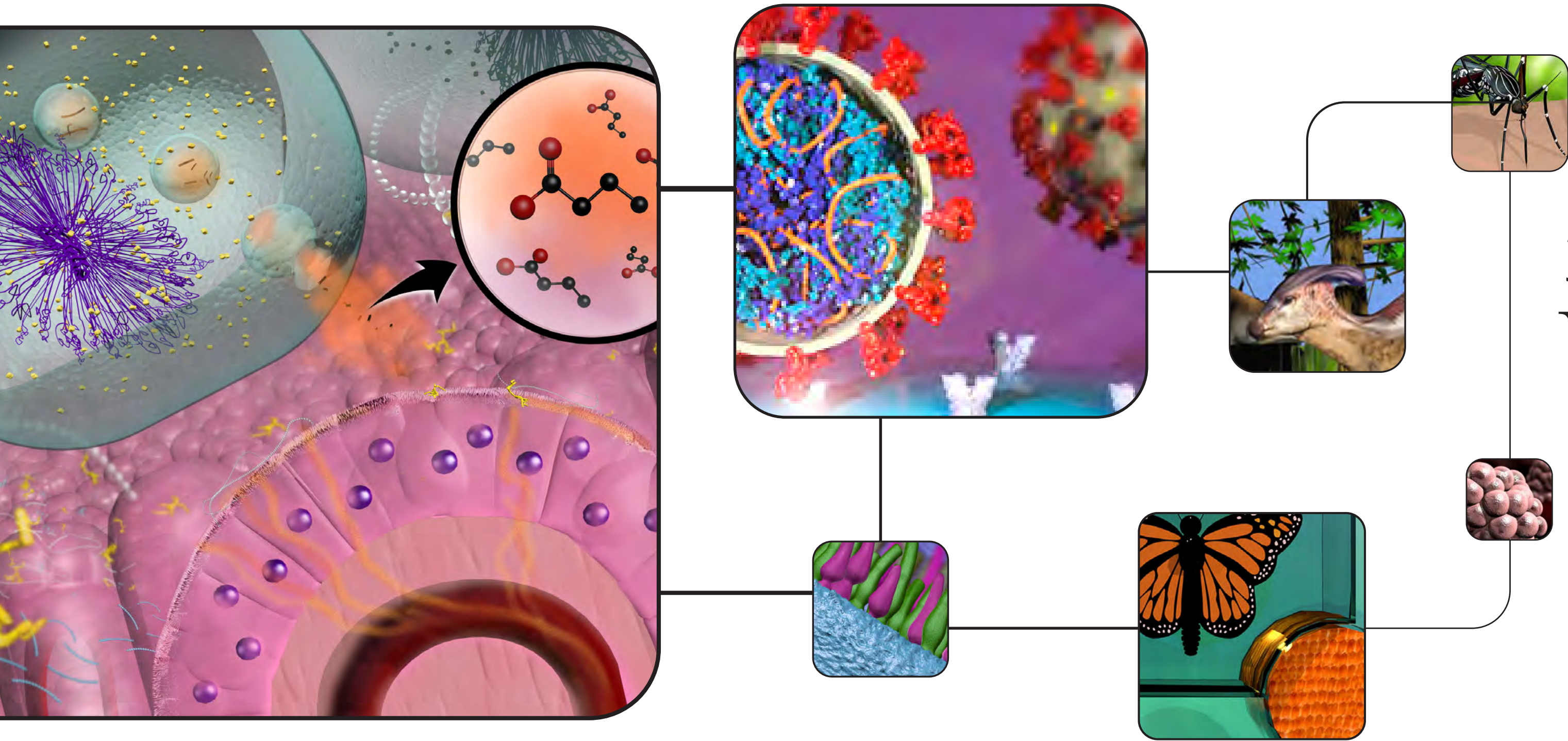
Still Life
Terry Nguyen 2021
12" x 18" Digital Painting



Still Life
Karlee D. Rogers 2019
12" x 18" Digital Painting



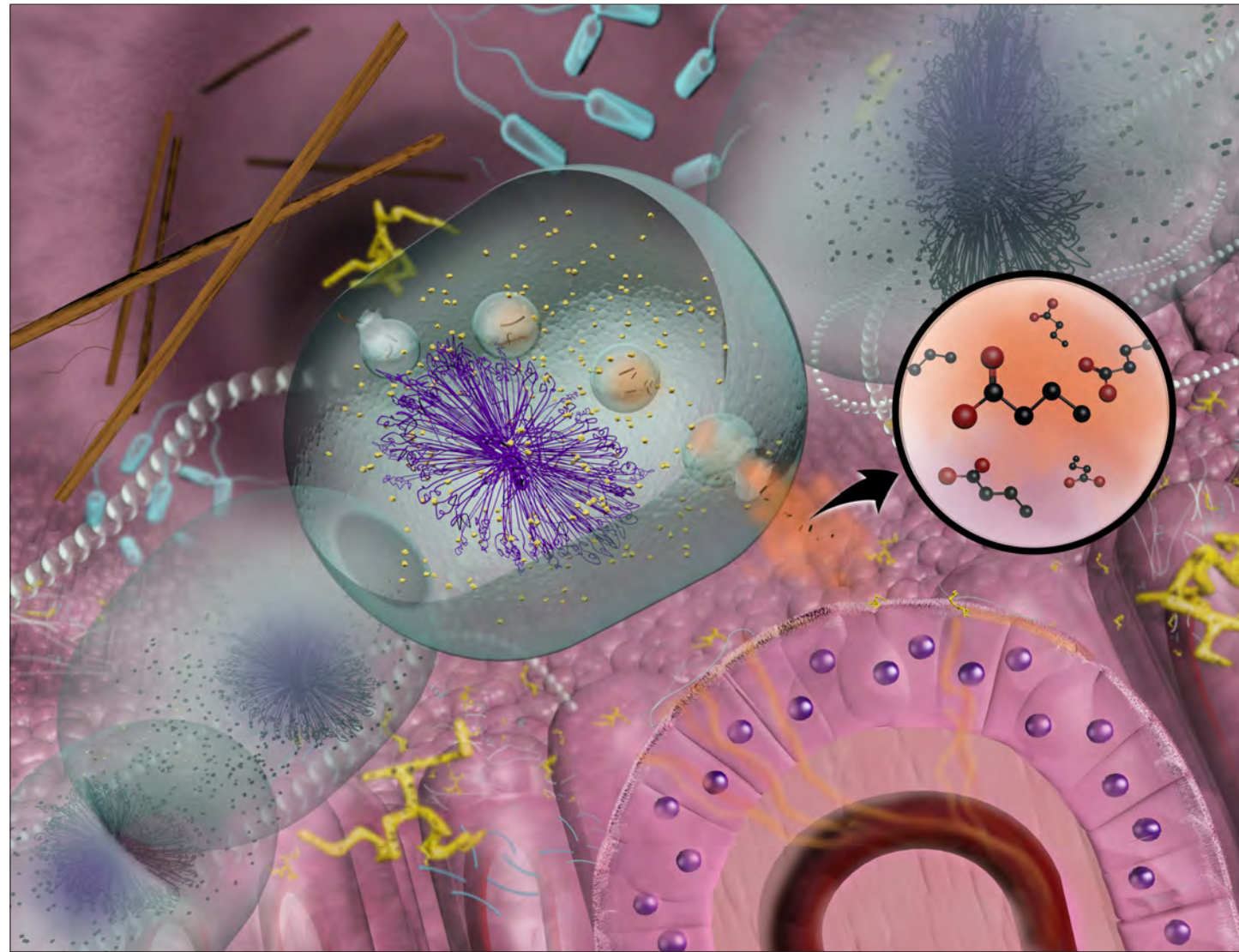
Elephas maximus
Lucas Petrin 2020
12" x 14" Water Color, Digital Media



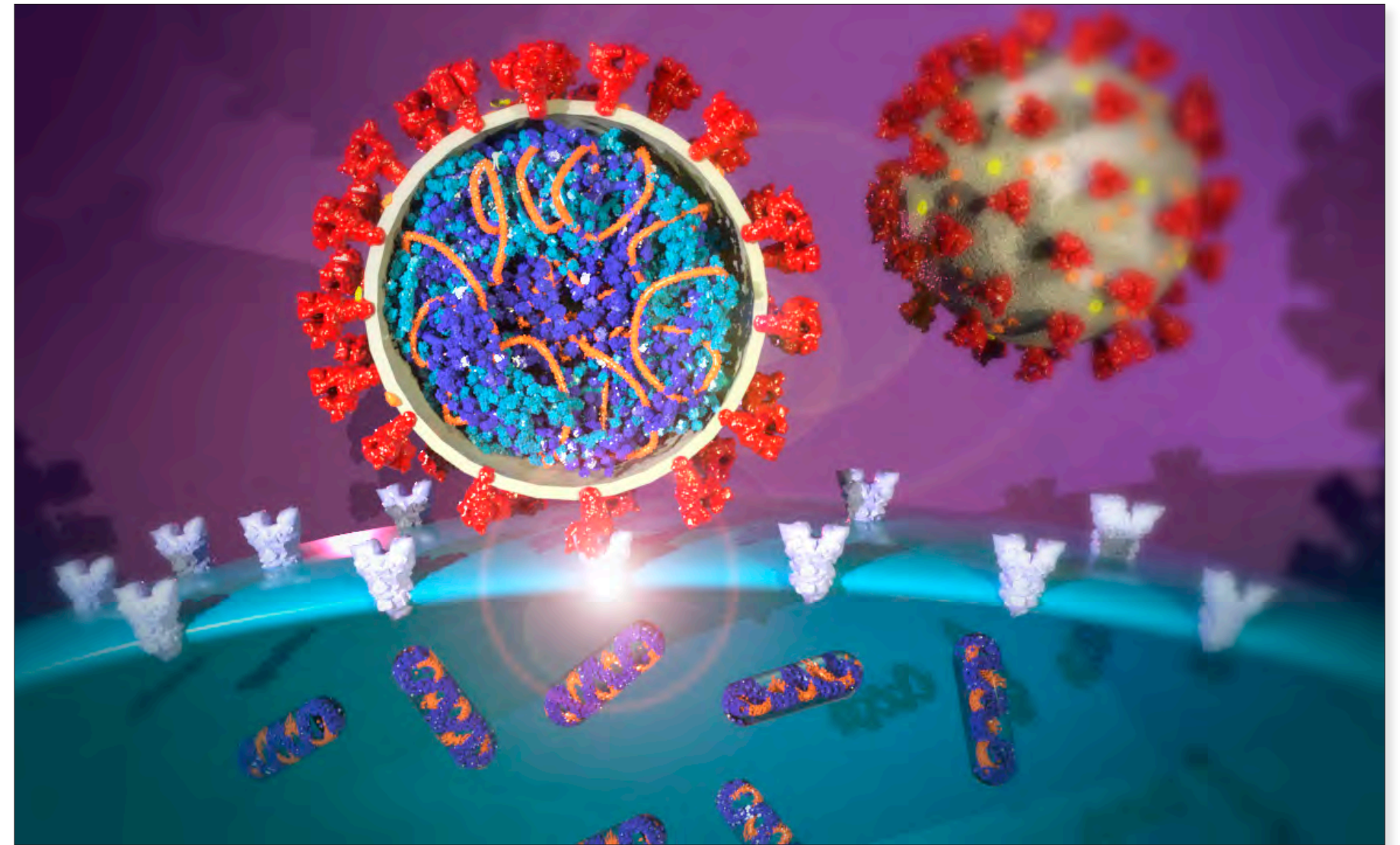
3D Visualization

The complexity of a subject, if crucial for understanding the story, needs to be shown in the visualization. Thus, in many cases, clarifying a subject requires increasing the amount of information, not reducing it.

— Alberto Cairo



Intestinal Biome
 Karlee D. Rogers 2020
 18" x 18" Digital Media



COVID-19
 Diana Lahr 2021
 18" x 24" Digital Media



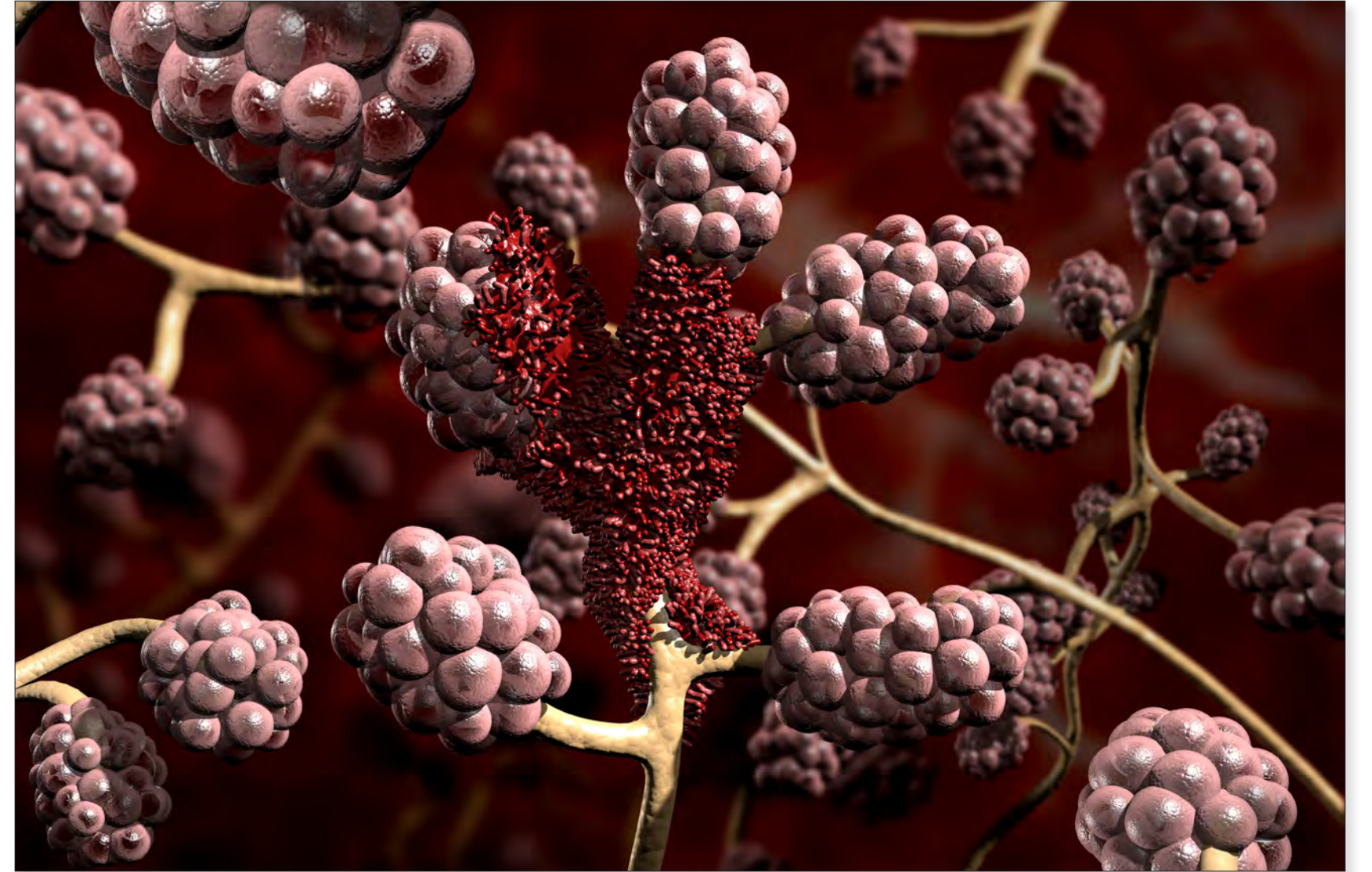
Neanderthal Head Reconstruction
Mariele Ford 2022
8" x 10" x 7.5" 3D Scan, Print, and Oil Based Clay



Virtual Reality Surgical O.R.
Jessica Angelini 2021
16" x 16" Digital Media



3D Sculpt:
Mosasaurus Reconstruction
Veronica Cava 2019
24" x 12" Digital Media



Adenocarcinoma
Veronica Cava 2019
12" x 18" Digital Media



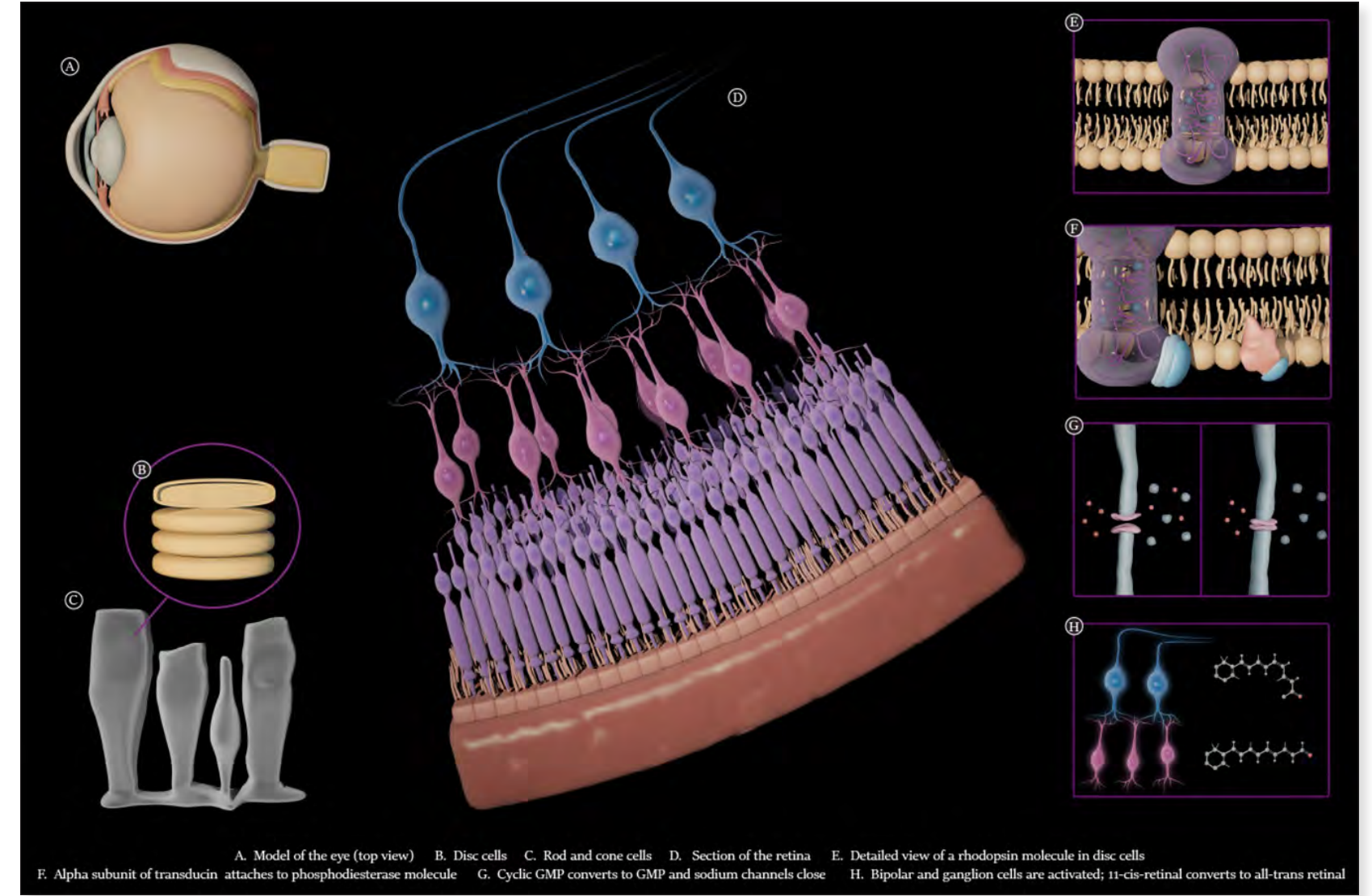
*3D Sculpt: African Spiny
Bush Viper (Atheris hispida)*
Delano Hendrix 2020
12" x 18" Digital Media



Inner Life of a Cell: Mitosis
Harley Modestowicz 2021
12" x 18" Digital Media



*Forensic Fascial Reconstruction:
Male Skull*
Kayla Deuter 2019
12" x 5" x 8" Clay, Acrylic and Plastic

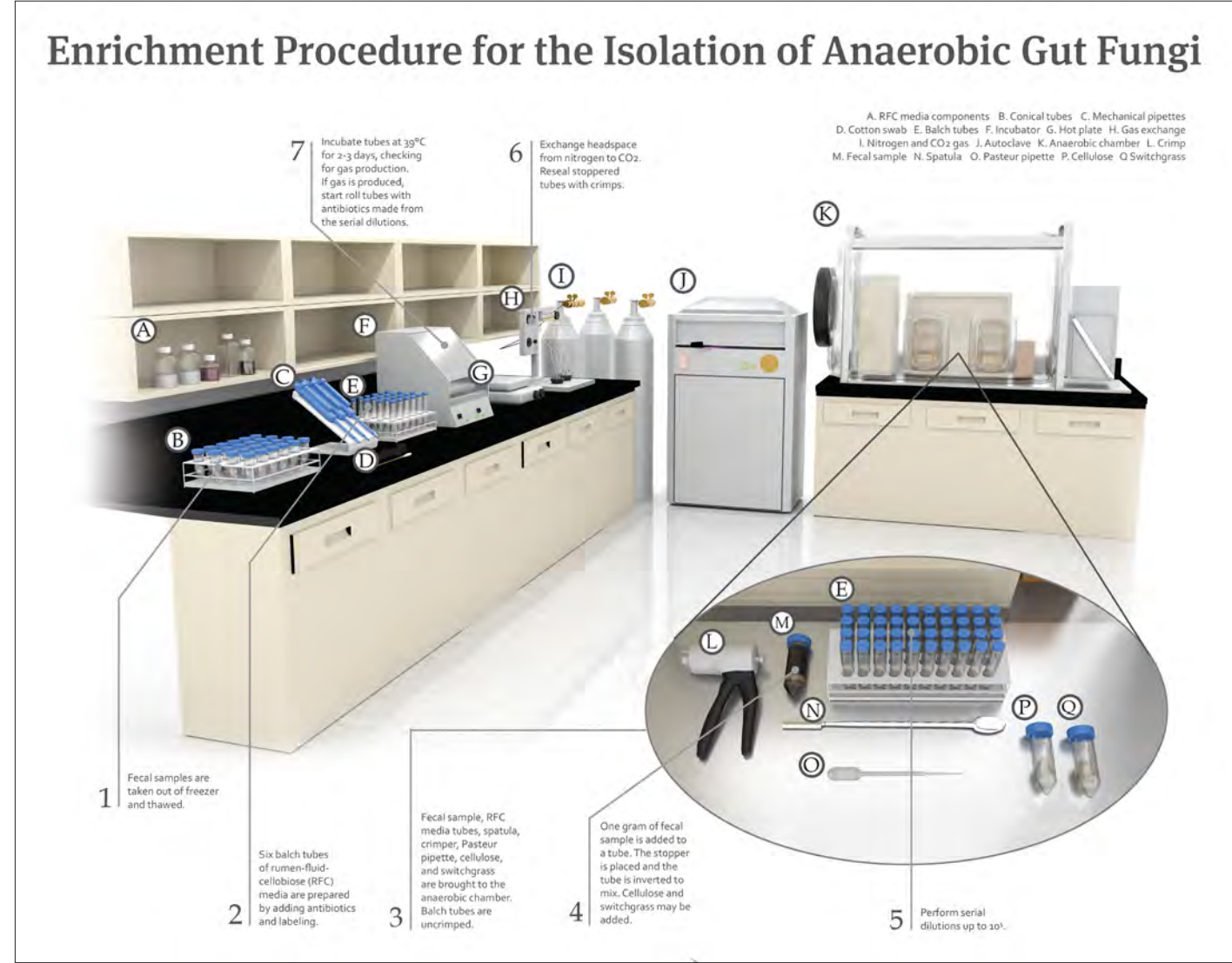


A. Model of the eye (top view) B. Disc cells C. Rod and cone cells D. Section of the retina E. Detailed view of a rhodopsin molecule in disc cells
F. Alpha subunit of transducin attaches to phosphodiesterase molecule G. Cyclic GMP converts to GMP and sodium channels close H. Bipolar and ganglion cells are activated; 11-cis-retinal converts to all-trans-retinal

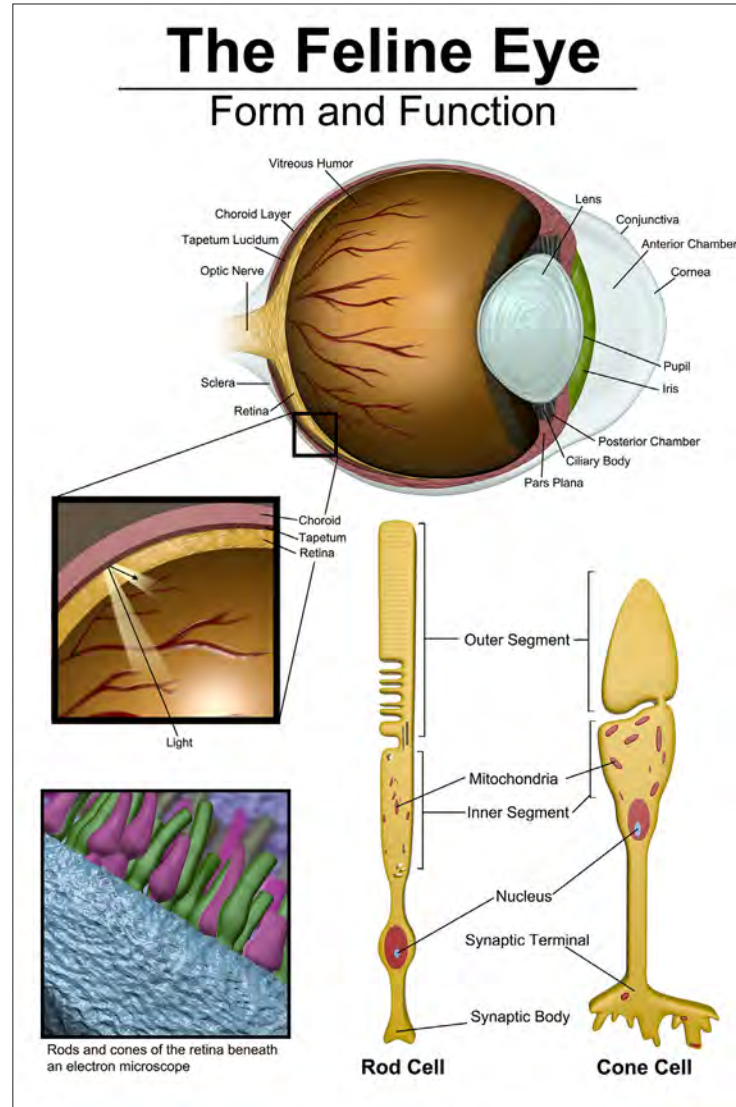
*The Phototransduction
Cascade Process*
Isabel Dory 2021
12" x 18" Digital Media



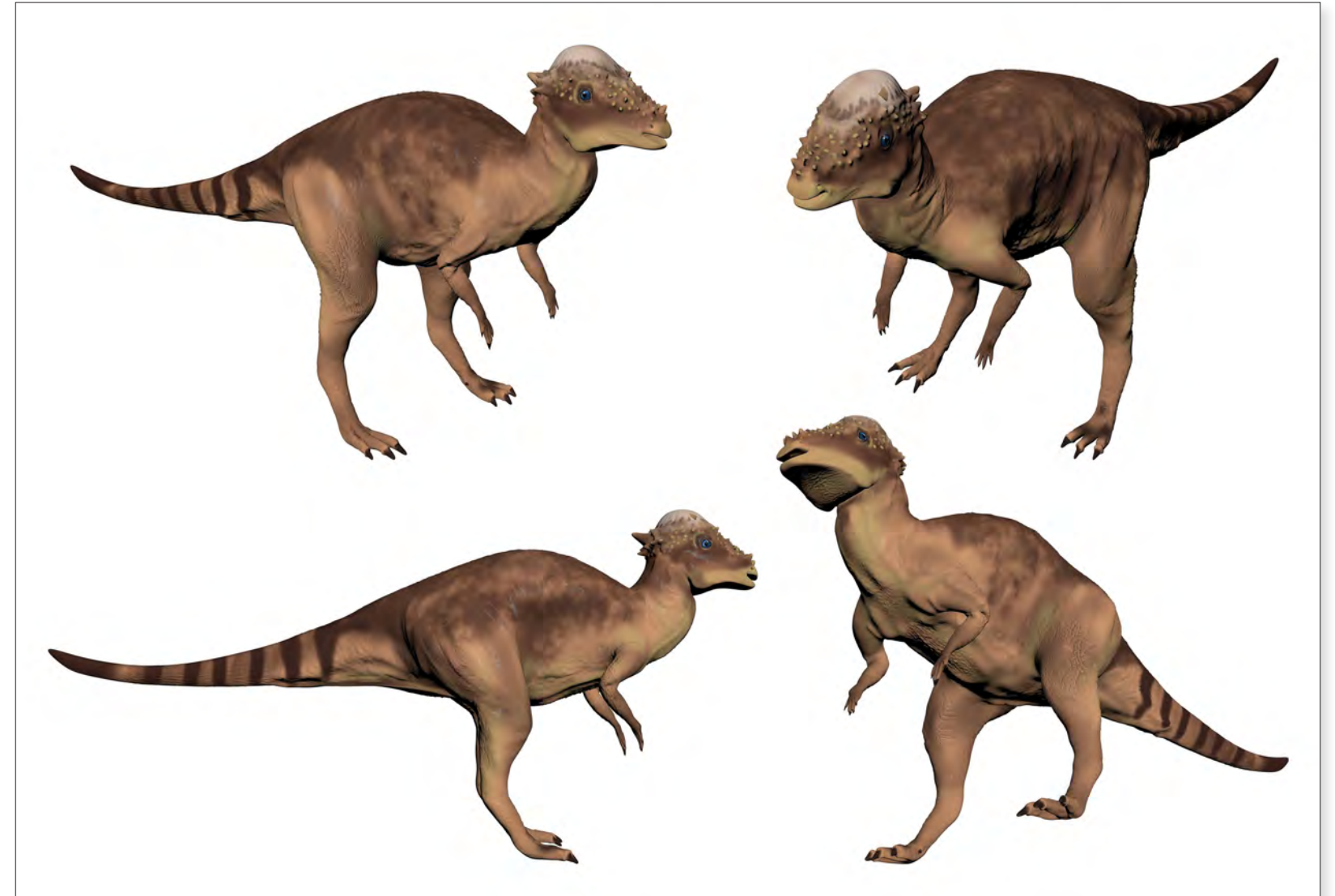
**Forensic Fascial Reconstruction:
Male Skull**
Colin Cho 2020
12" x 5" x 8" Clay, Wood and Plastic



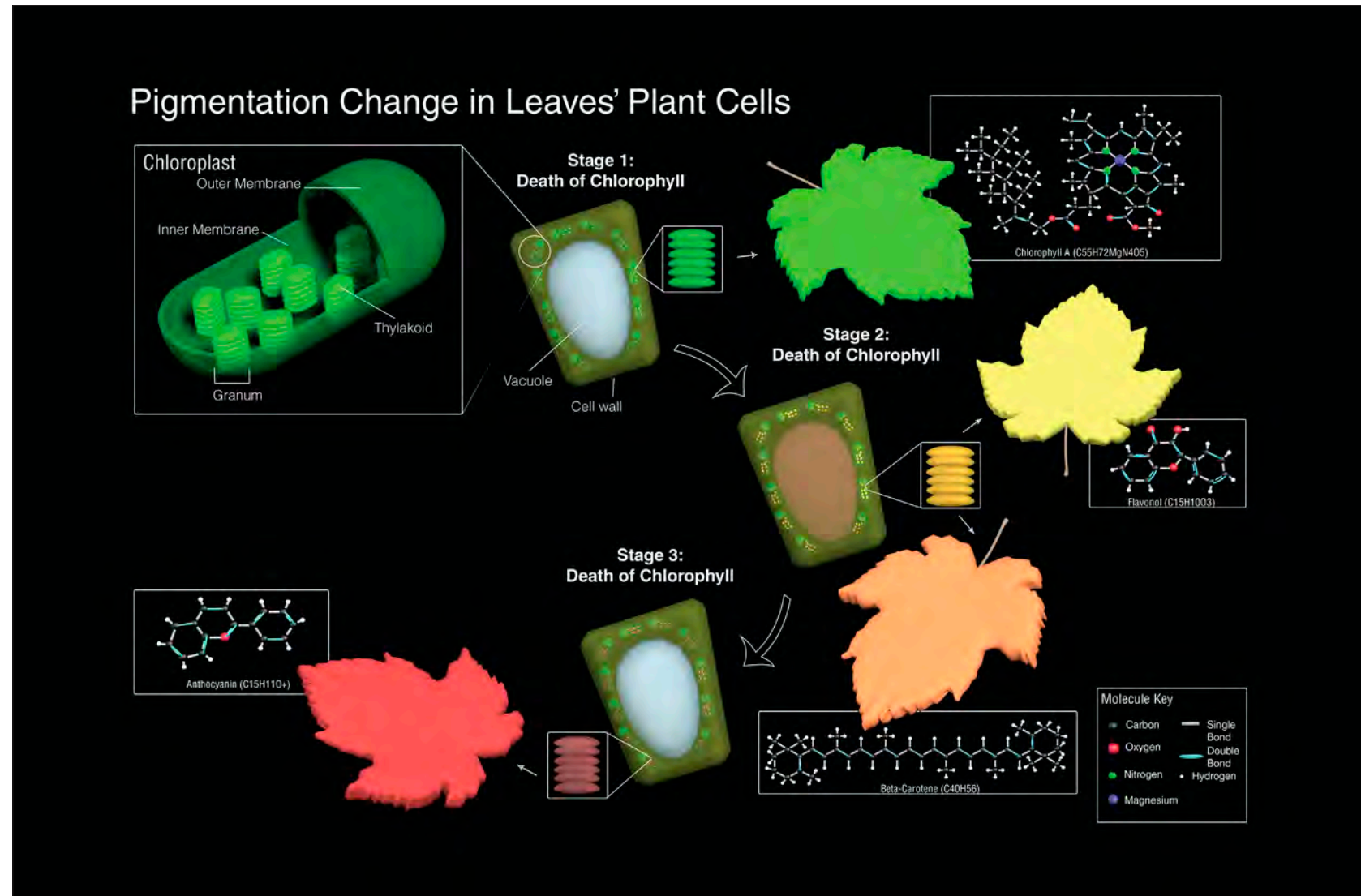
**Enrichment Procedure for the
Isolation of Anaerobic Gut Fungi**
Emerson Harman 2021
12" x 18" Digital Media



The Feline Eye
Taylor McKeown 2019
24" x 18" Digital Media



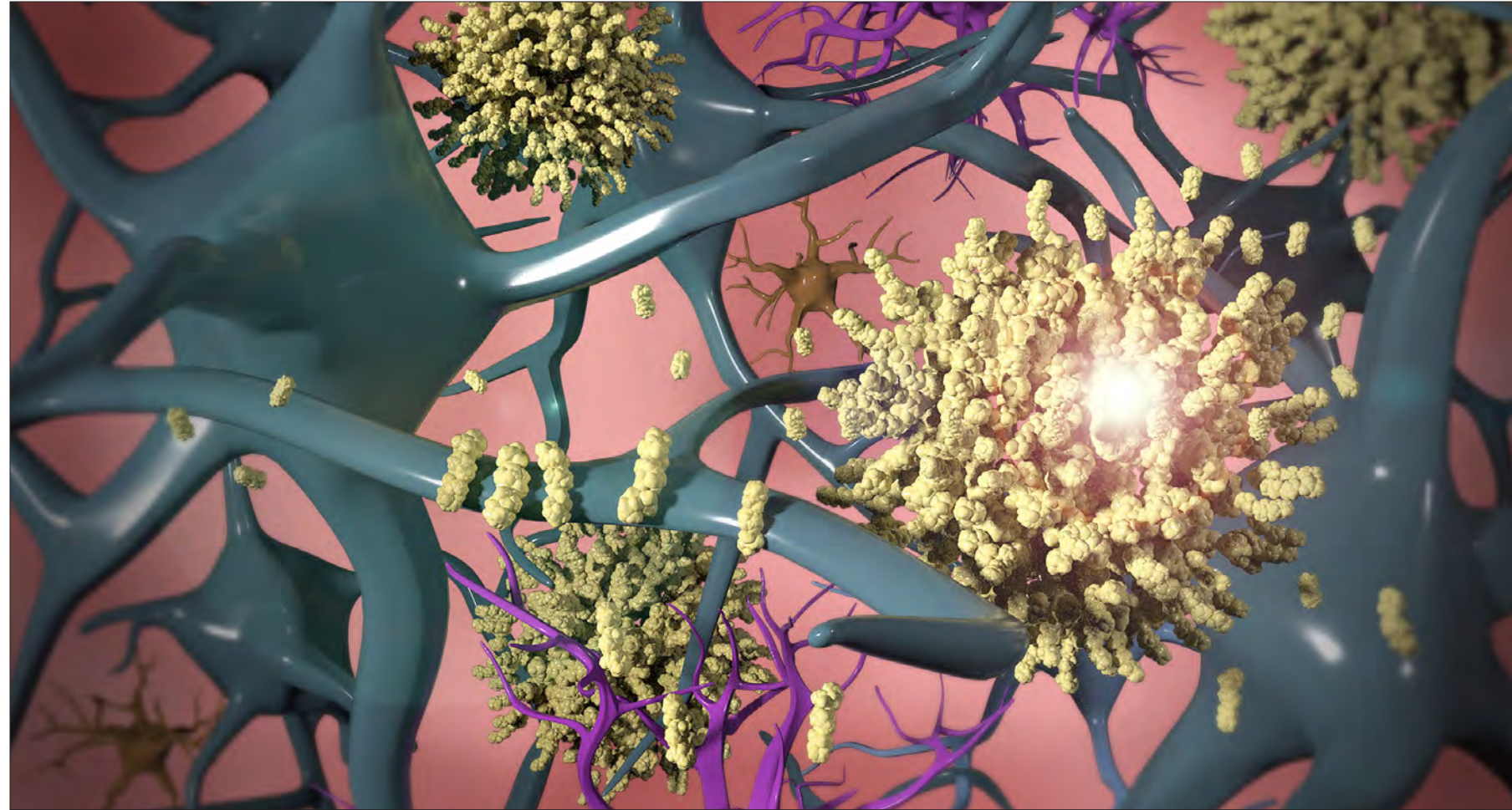
3D Sculpt: Pachycephalosaurus
Santiago Gomez-Vargas 2019
12" x 18" Digital Media



Leaf Pigmentation
Sofia Monaco 2019
14" x 18" Digital Media



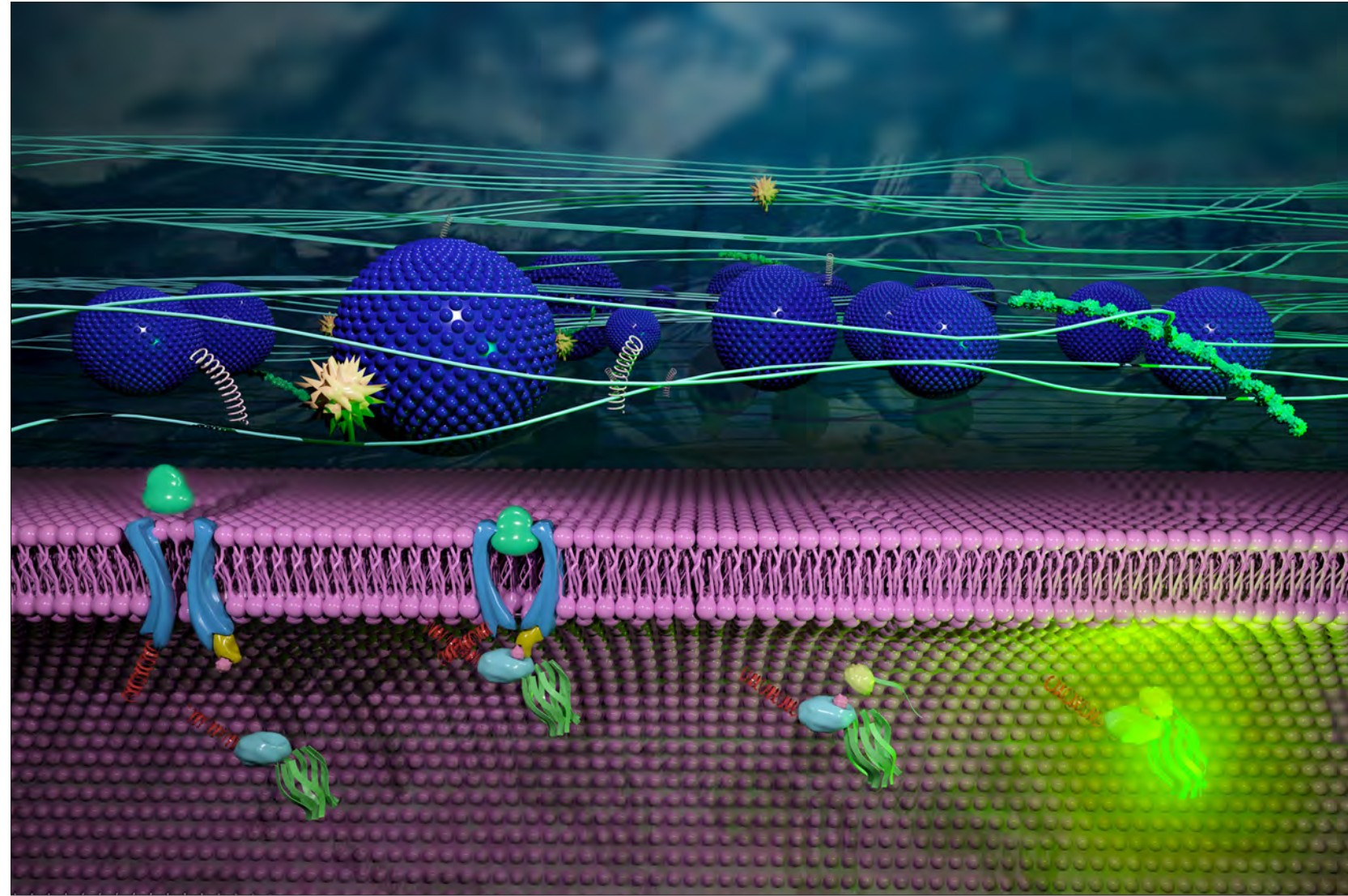
3D Sculpt: Mosquito (Aedes aegypti)
Hannah Knight 2019
12" x 16" Digital Media



How Alzheimer's Changes the Brain
Katya Cyrulik 2020
14" x 20" Digital Media



3D Sculpt: Parasaurolophus
Sofia Monaco 2019
14" x 20" Digital Media



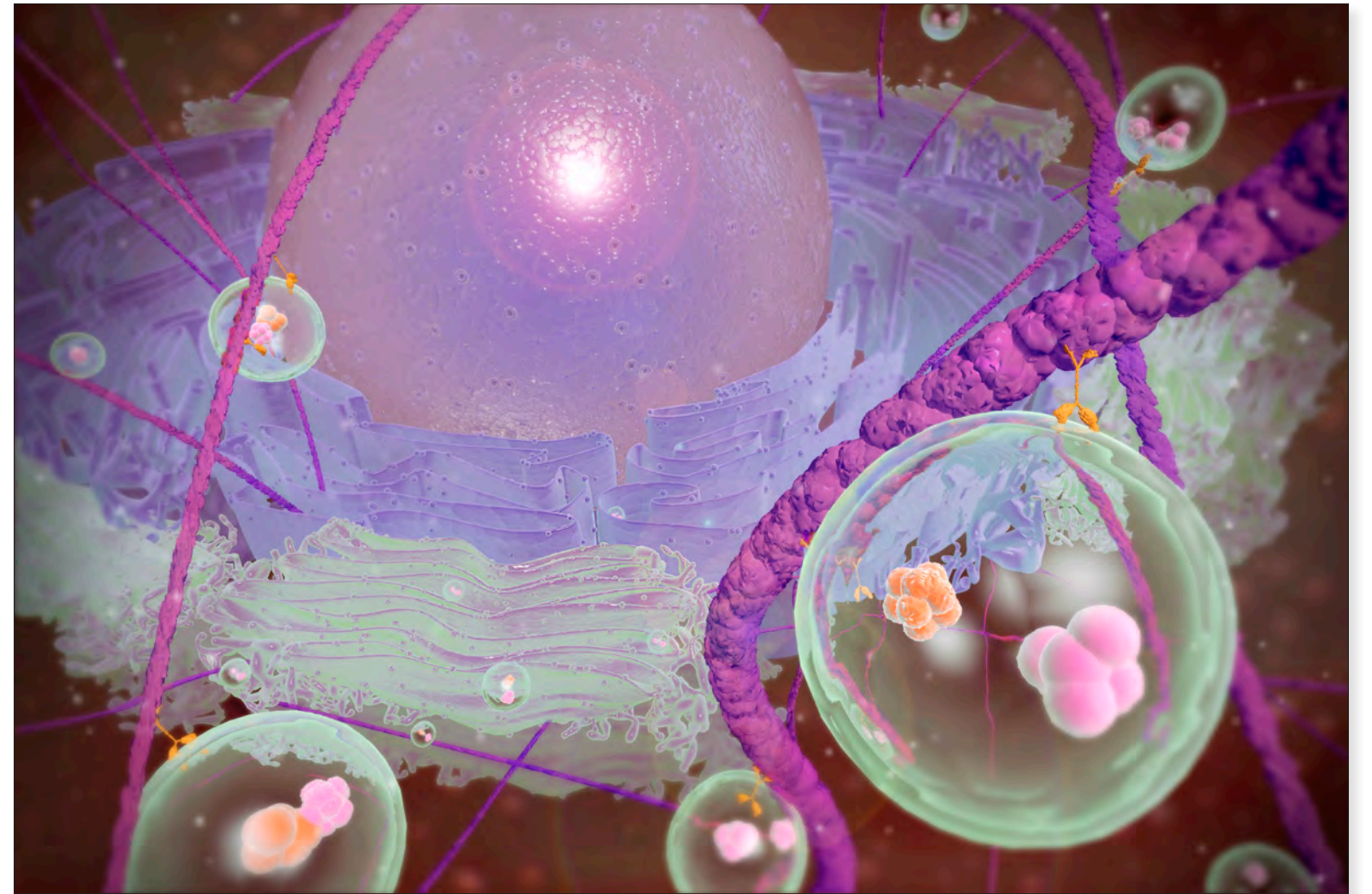
*Post-Translational Circuit
Synthetic Bioreceptor*
John DesRochers 2021
12" x 18" Digital Media



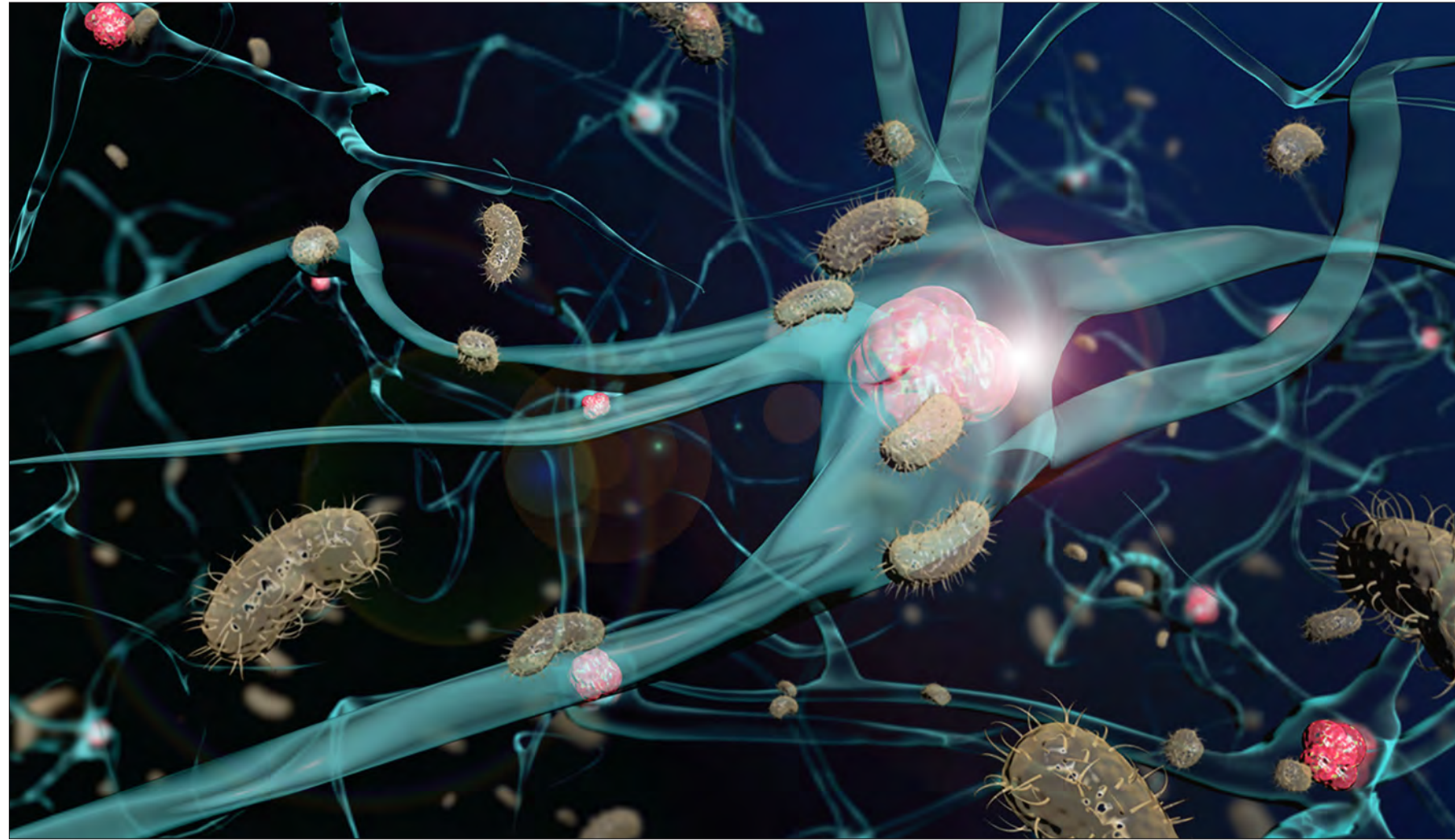
*3D Sculpt:
Dracorex hogwartsia*
Katlyn Lynn 2021
9" x 18" Digital Media



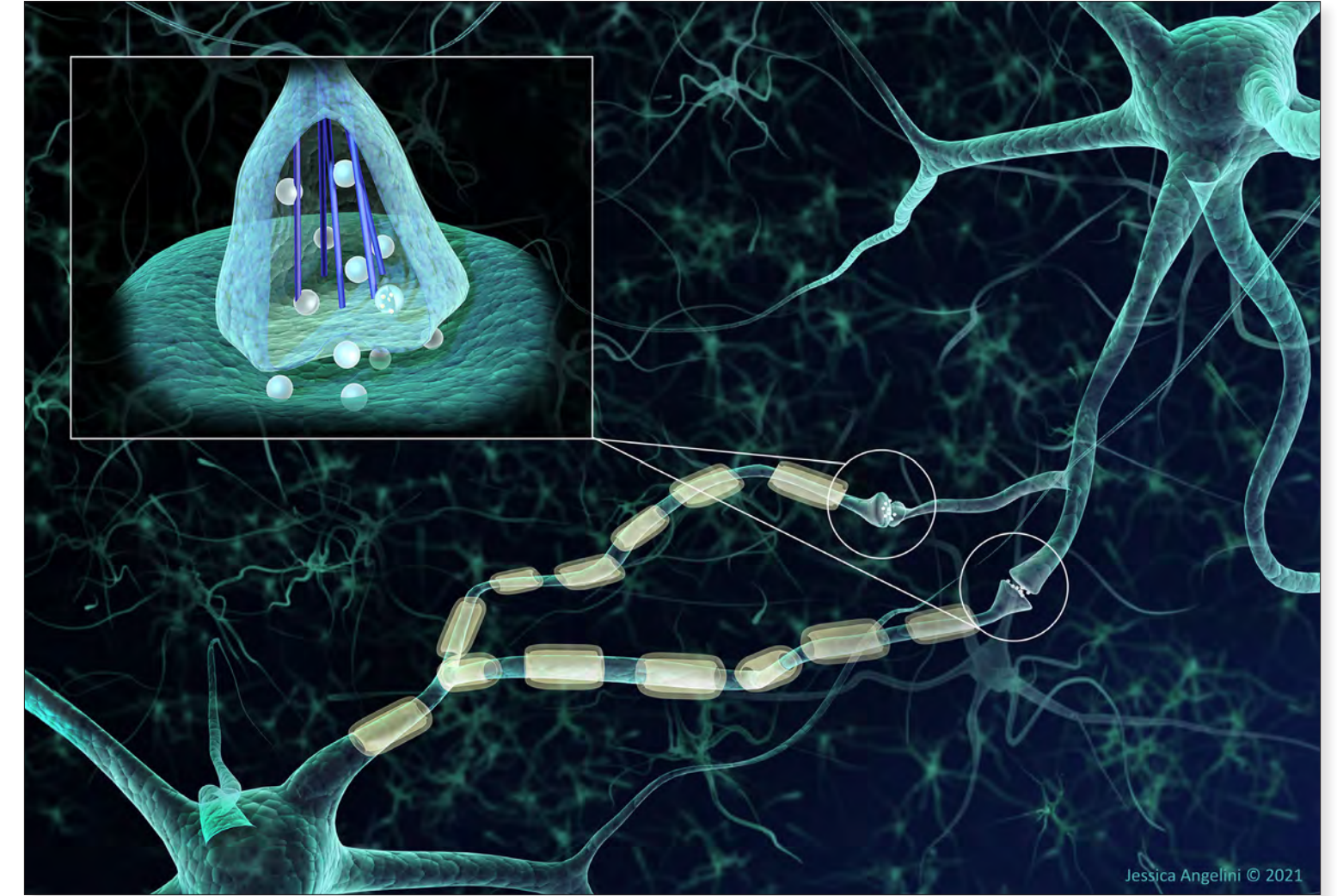
Life Stages of The Monarch Butterfly
Casey Aubry 2020
12" x 18" Digital Media



*Inner Life of a Cell:
Golgi Apparatus*
Leeza Duller 2021
12" x 18" Digital Media



Rabies Virus & Neurodegeneration
Santiago Gomez 2019
12" x 18" Digital Media

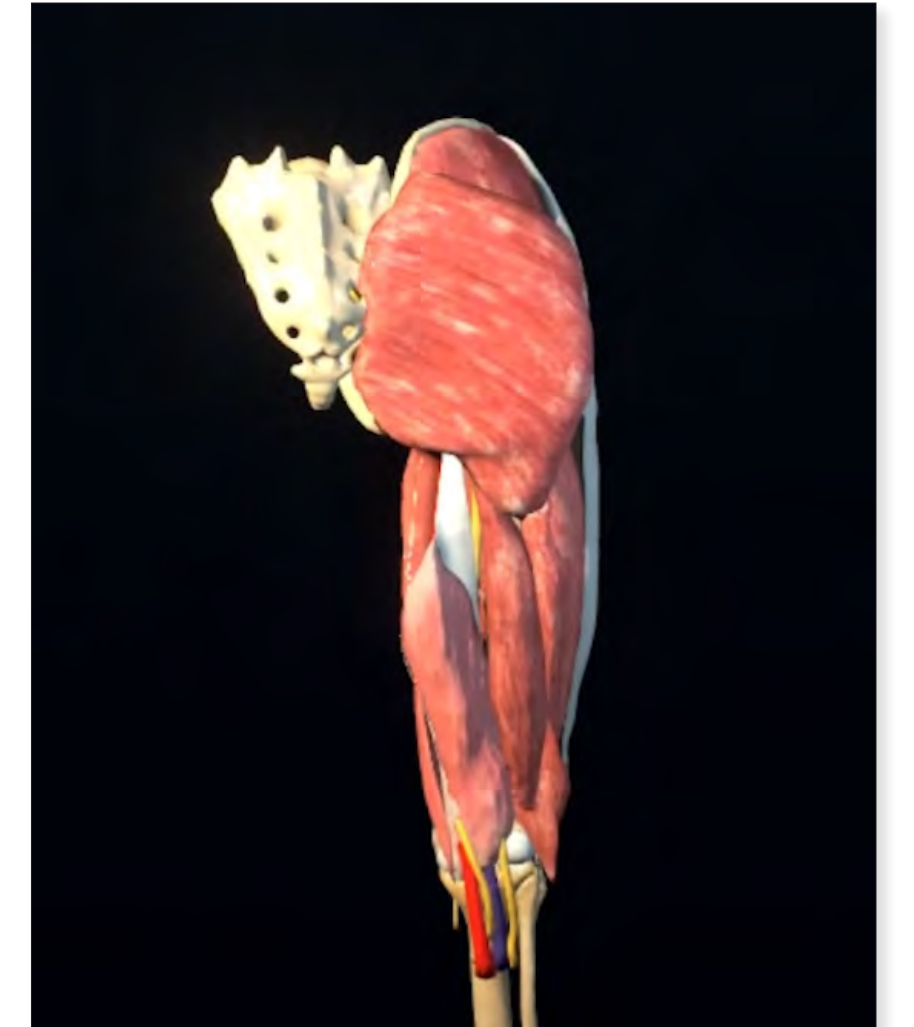
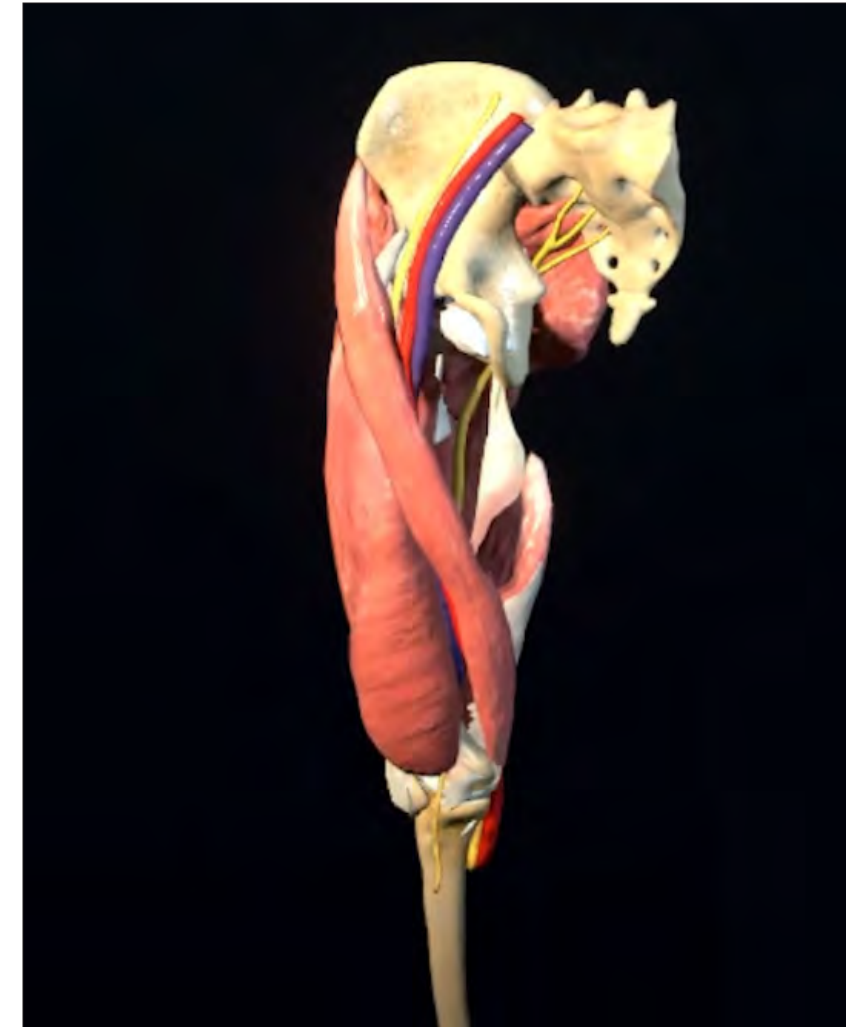


Neural Synaptic Junction
Jessica Angelini 2020
12" x 18" Digital Media

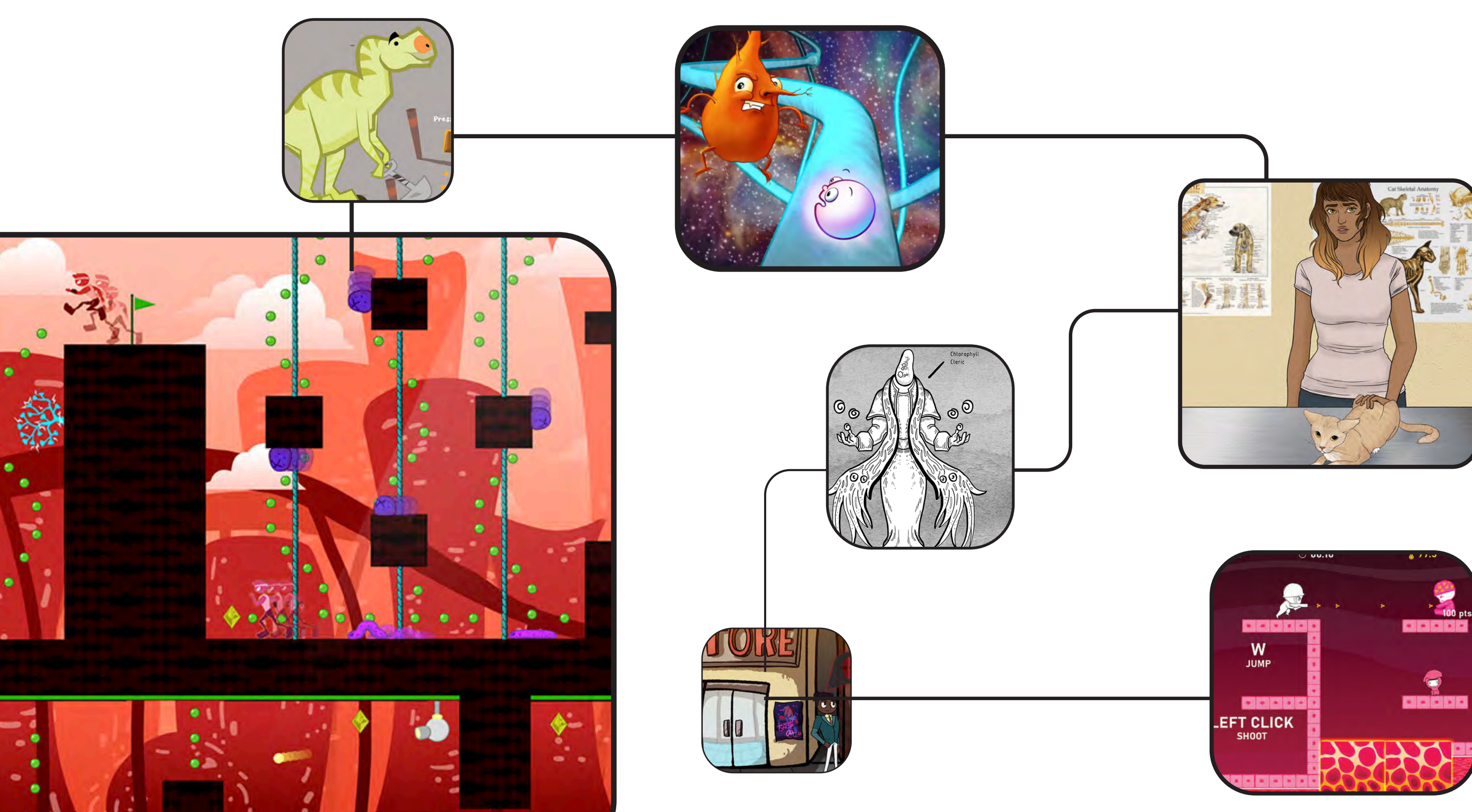
Jessica Angelini © 2021



VR Total Hip Arthroplasty Simulation
 TEAM: V.Cava, T.Nguyen, S.Monaco, L.Smith, D.Hendrix 2021
 12" x 18" Digital Media



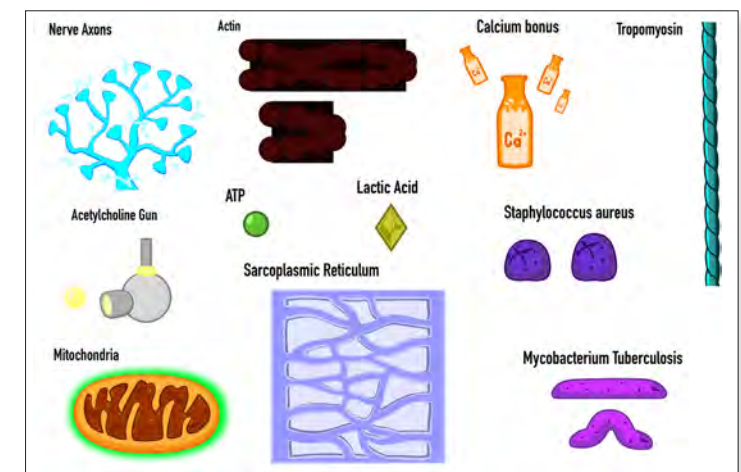
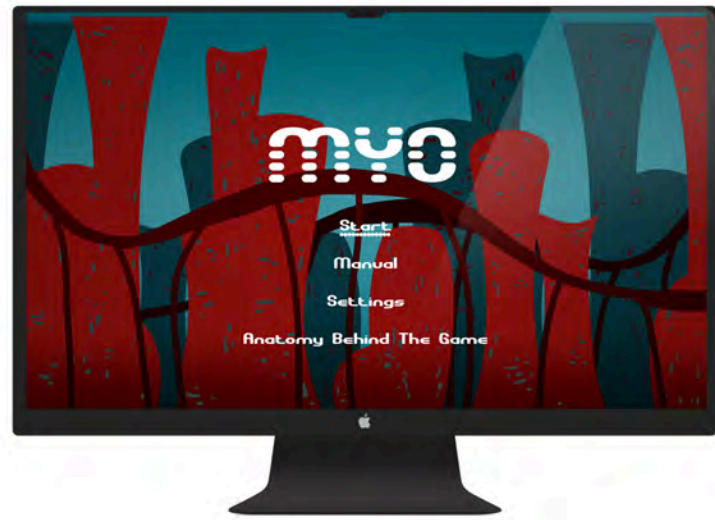
VR Total Hip Arthroplasty Anatomical Models
 TEAM: V.Cava, T.Nguyen, S.Monaco, L.Smith, D.Hendrix 2021
 12" x 18" Digital Media



Game Design

We've been playing games since humanity had civilization — there is something primal about our desire and our ability to play games. It's so deep-seated that it can bypass latter-day cultural norms and biases.

— Jane McGonigal



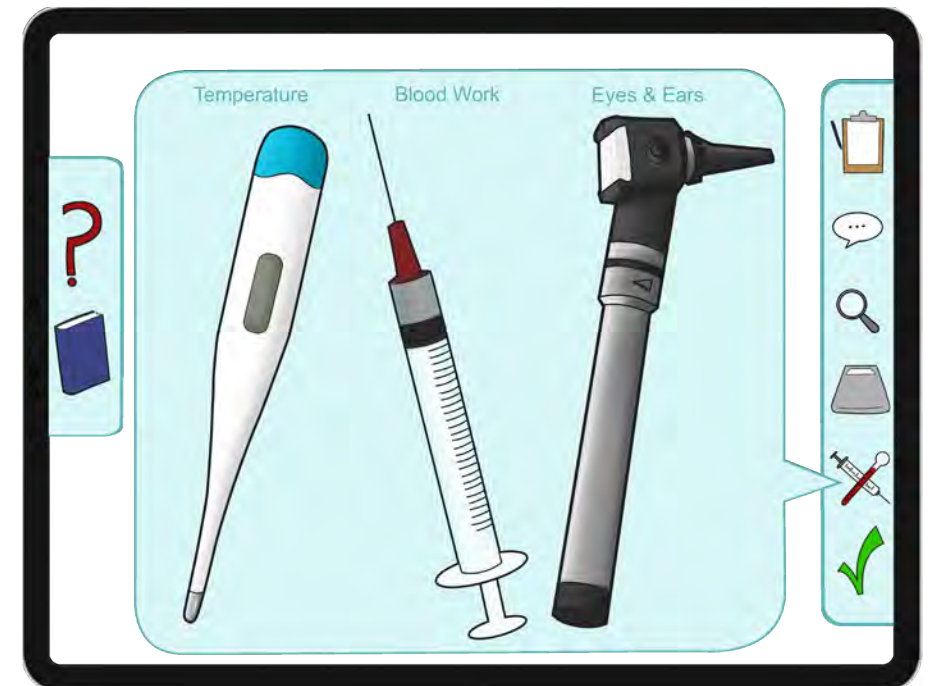
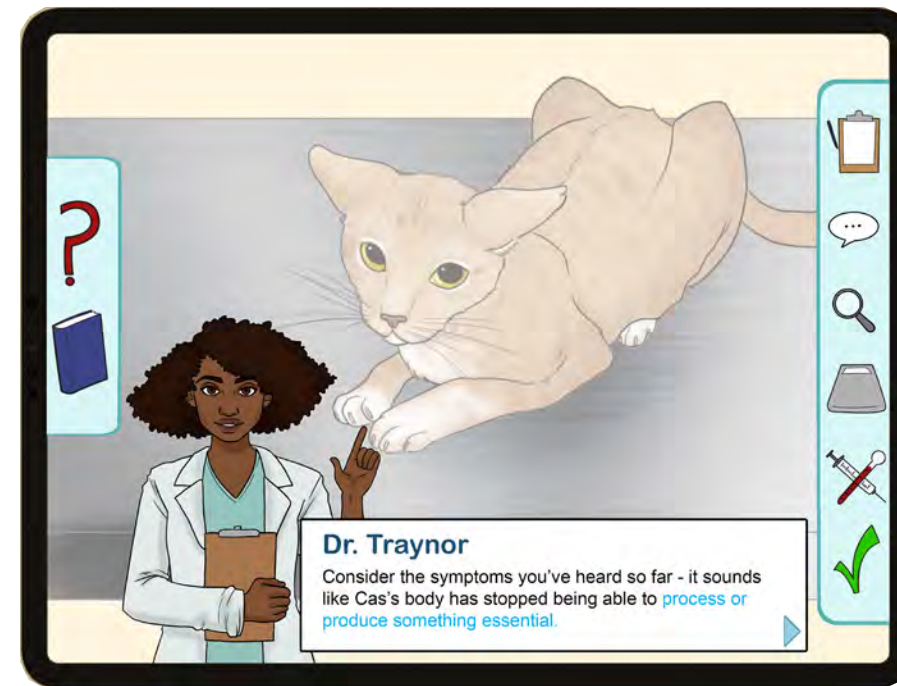
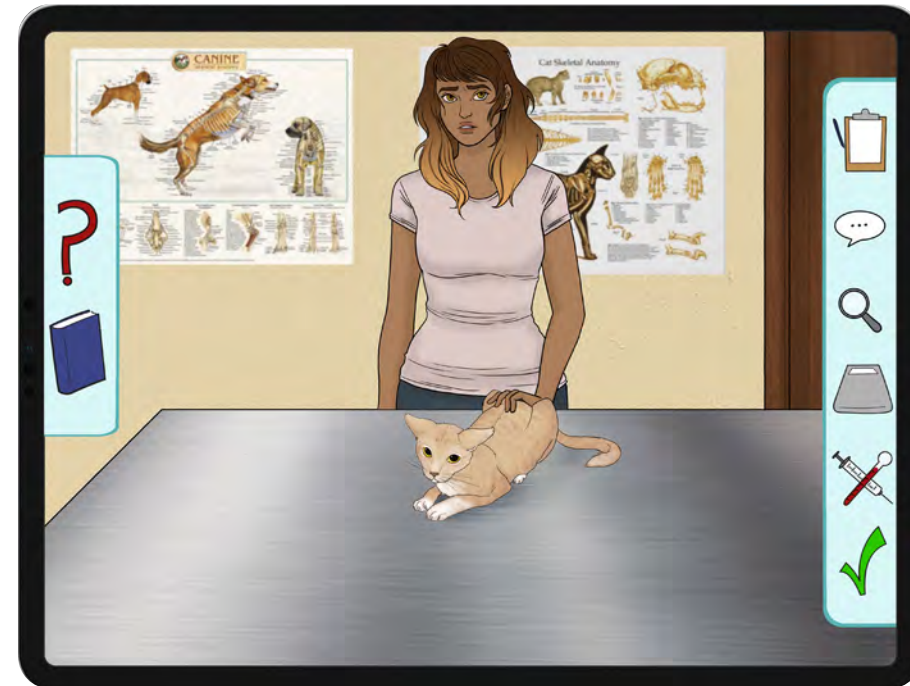
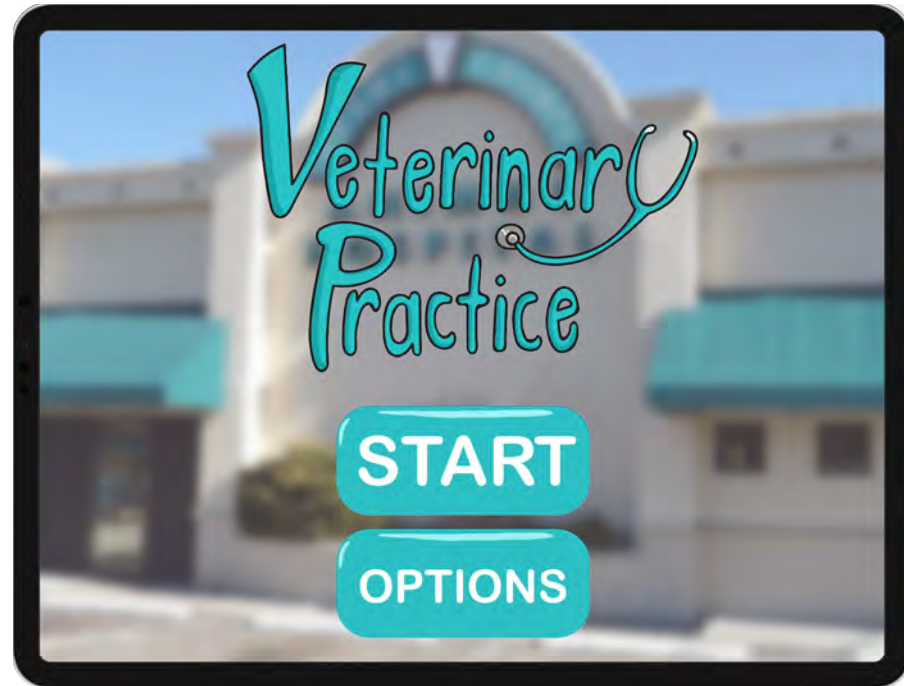
Myo Game: Muscle Structure & Function

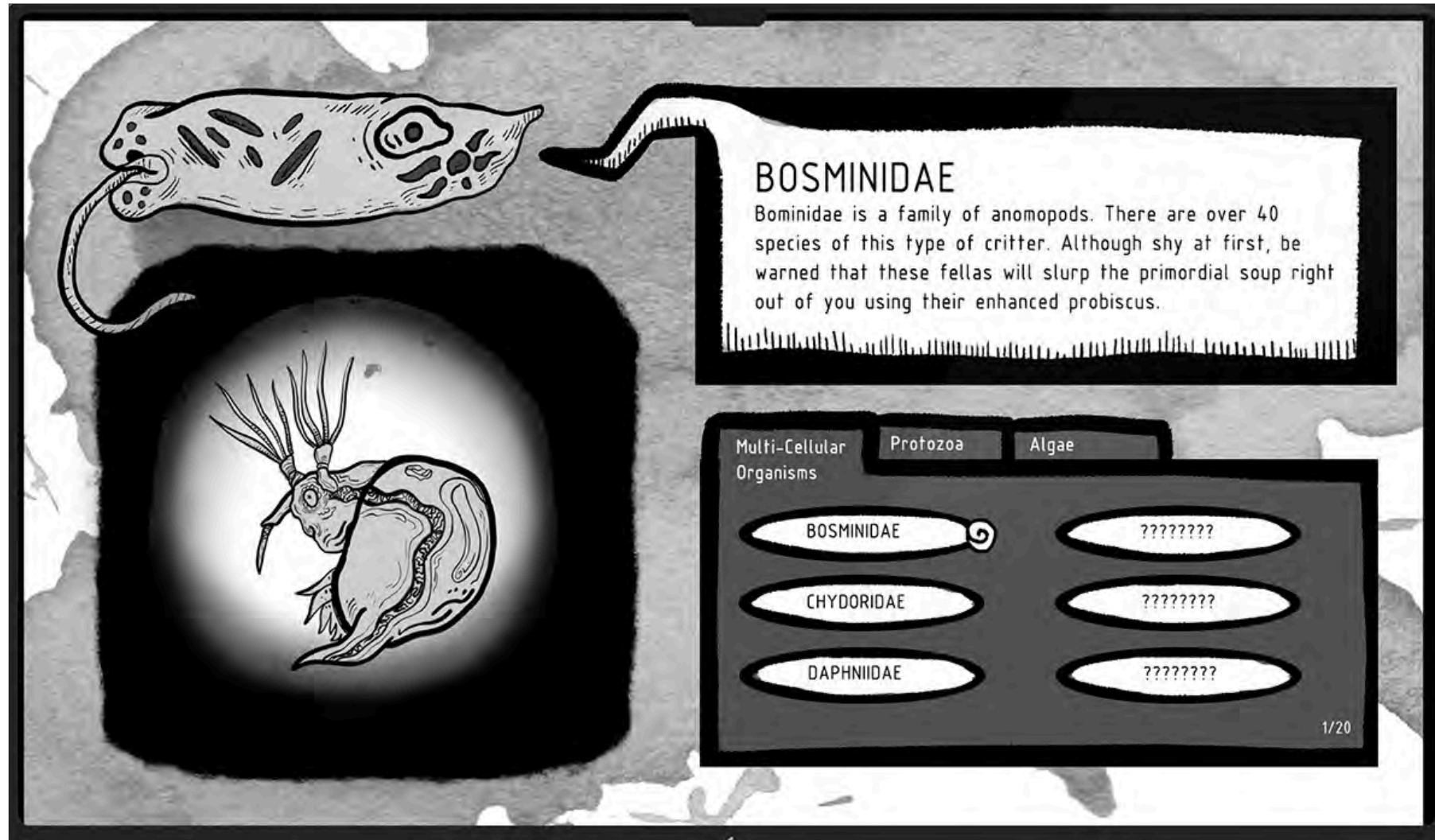
Joelle Jordan 2019

1080 x 1920 HD Digital Media



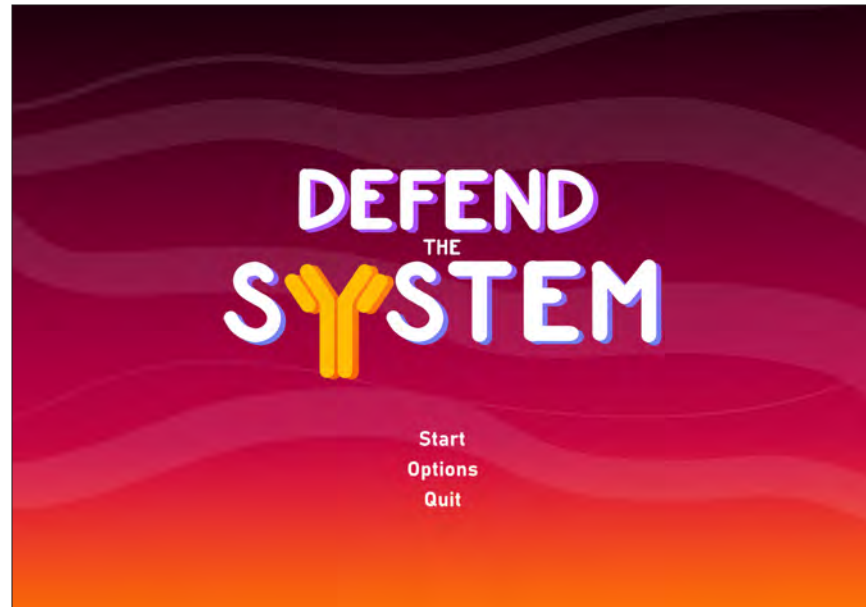
Heath
Dani Jewell 2021
1080 x 1920 HD Digital Media



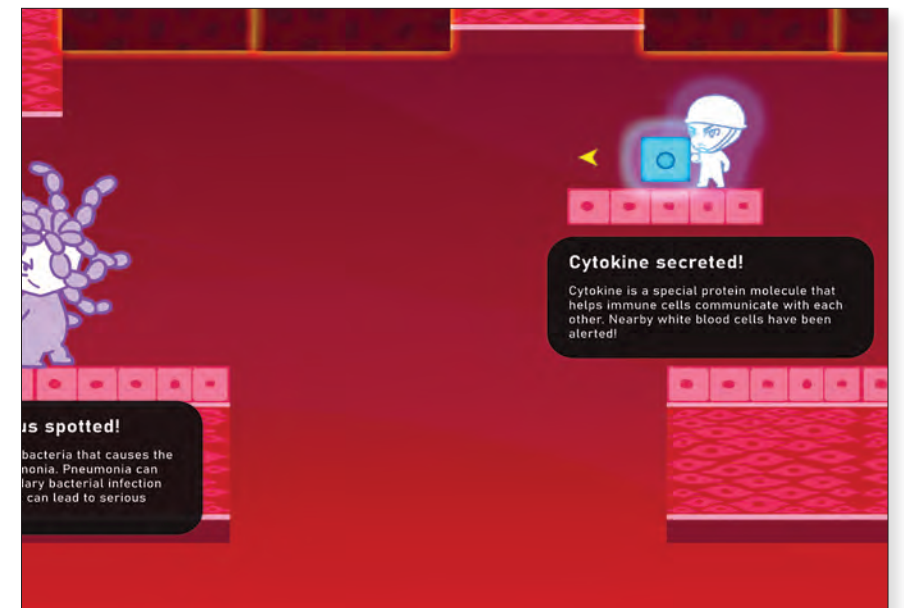
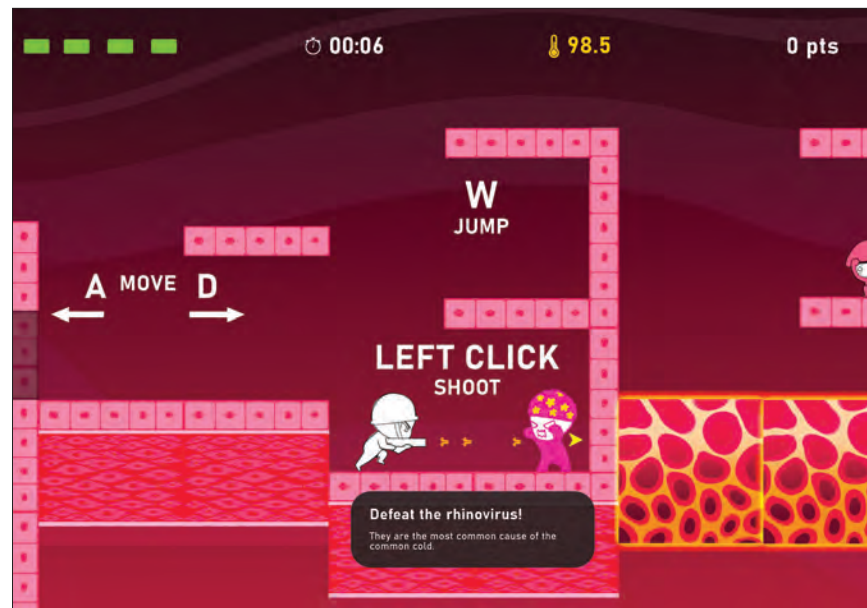
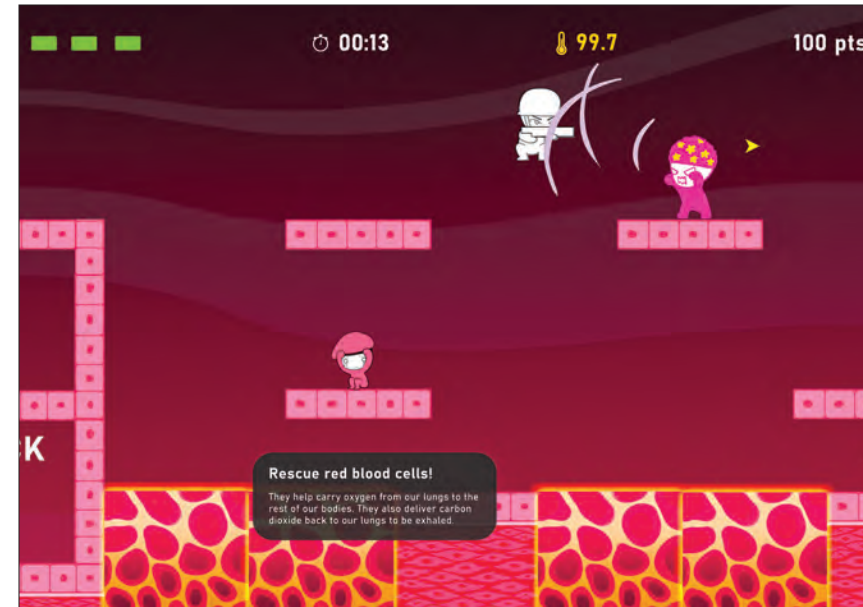


Pond Scum Adventure Game
 Allison Mosley 2020
 1080 x 1920 HD Digital Media





Defend The System Platformer
Terry Nguyen 2021
1080 x 1920 HD Digital Media

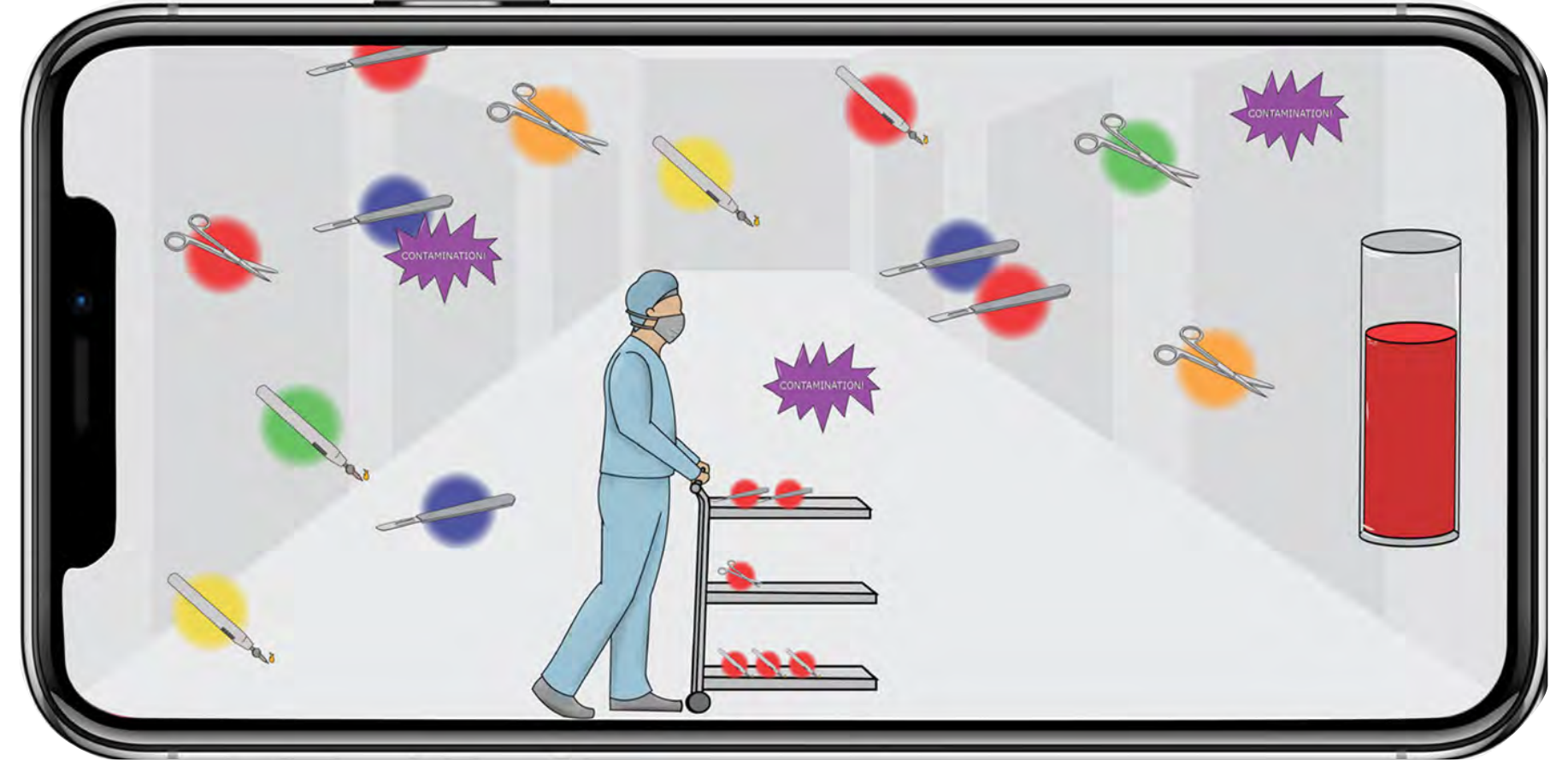
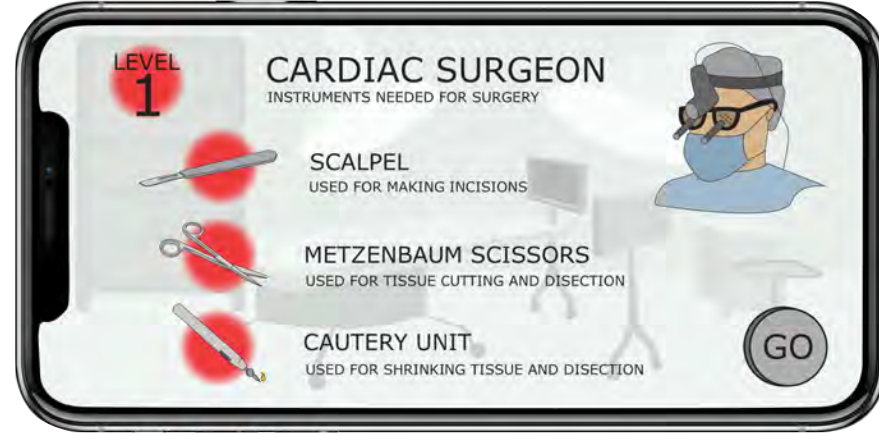




Kansha Switch Platformer
Kelsey Ross 2019
1080 x 1920 HD Digital Media

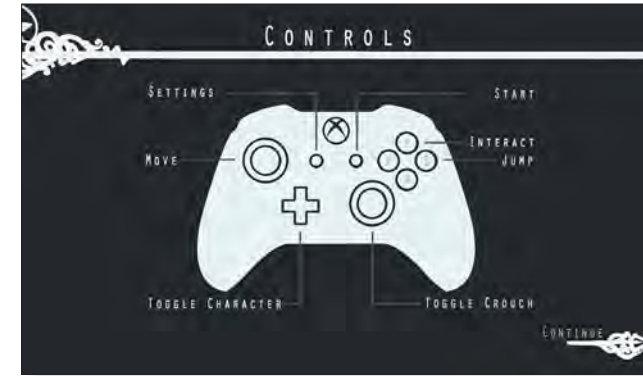


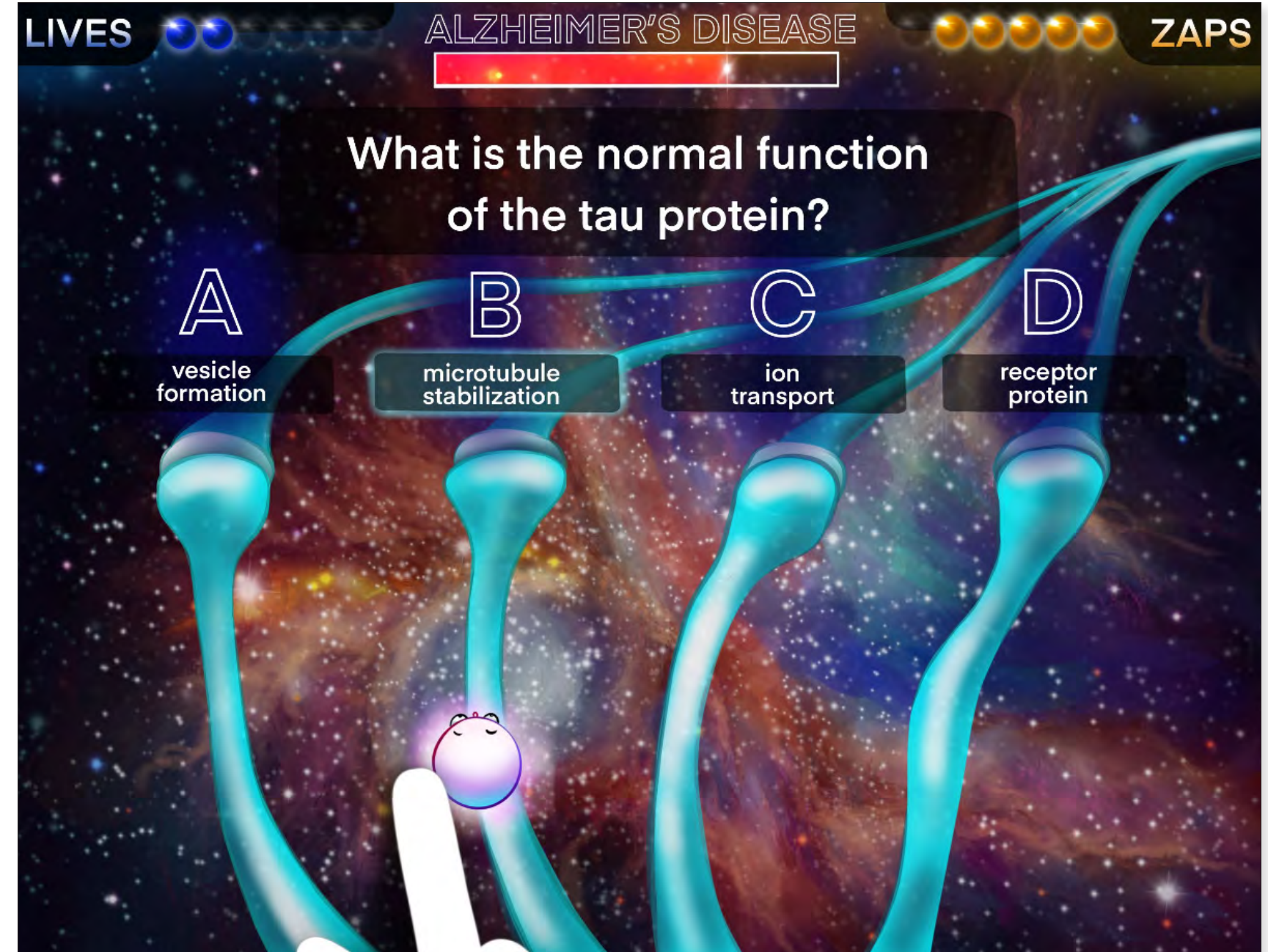
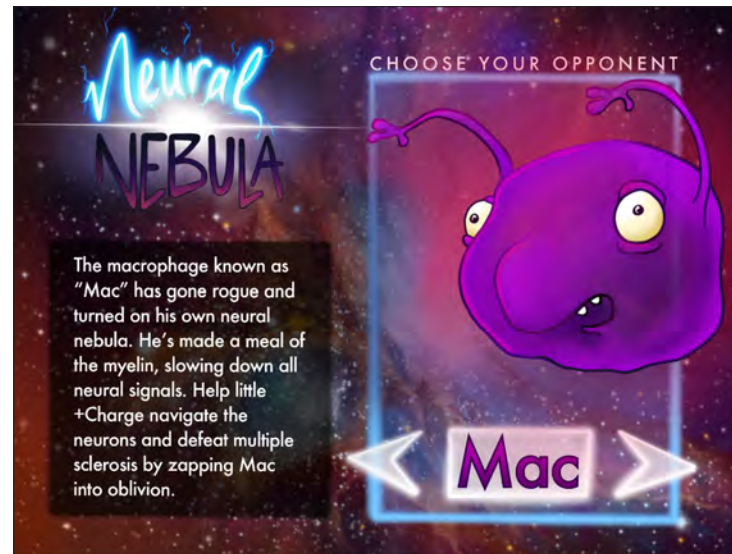
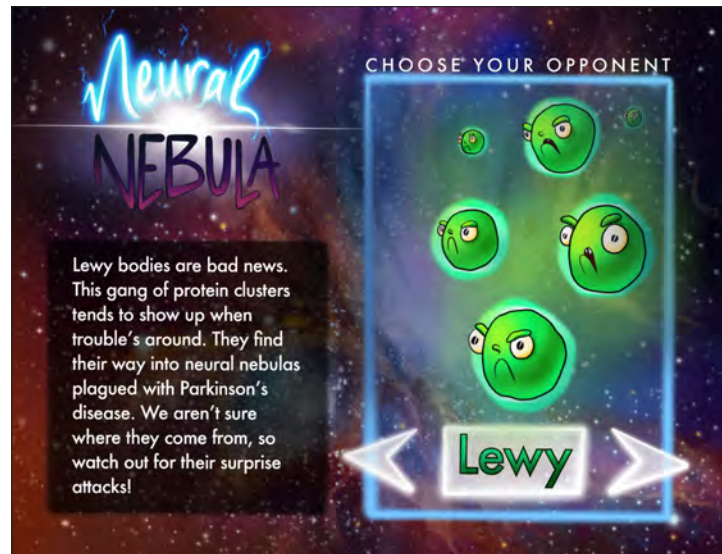
Dig Days PC Game
 Lucas Petrin 2019
 1080 x 1920 HD Digital Media



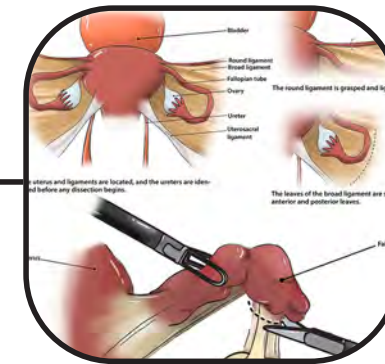
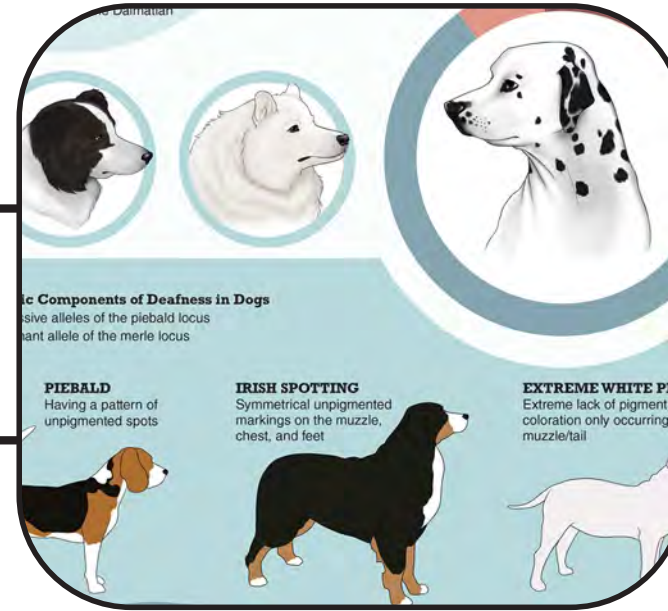
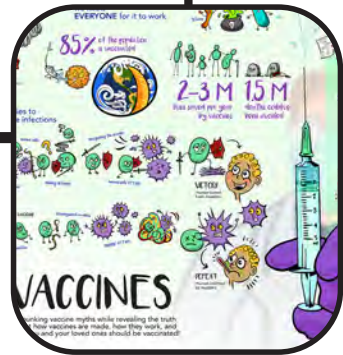


Time Stands Still Platformer
 Courtney Tesone 2019
 1080 x 1920 HD Digital Media





Neural Nebula iOS App Game
 Karlee D. Rogers 2019
 1080 x 1920 HD Digital Media



Information Design

The commonality between science and art is in trying to see profoundly — to develop strategies of seeing and showing.

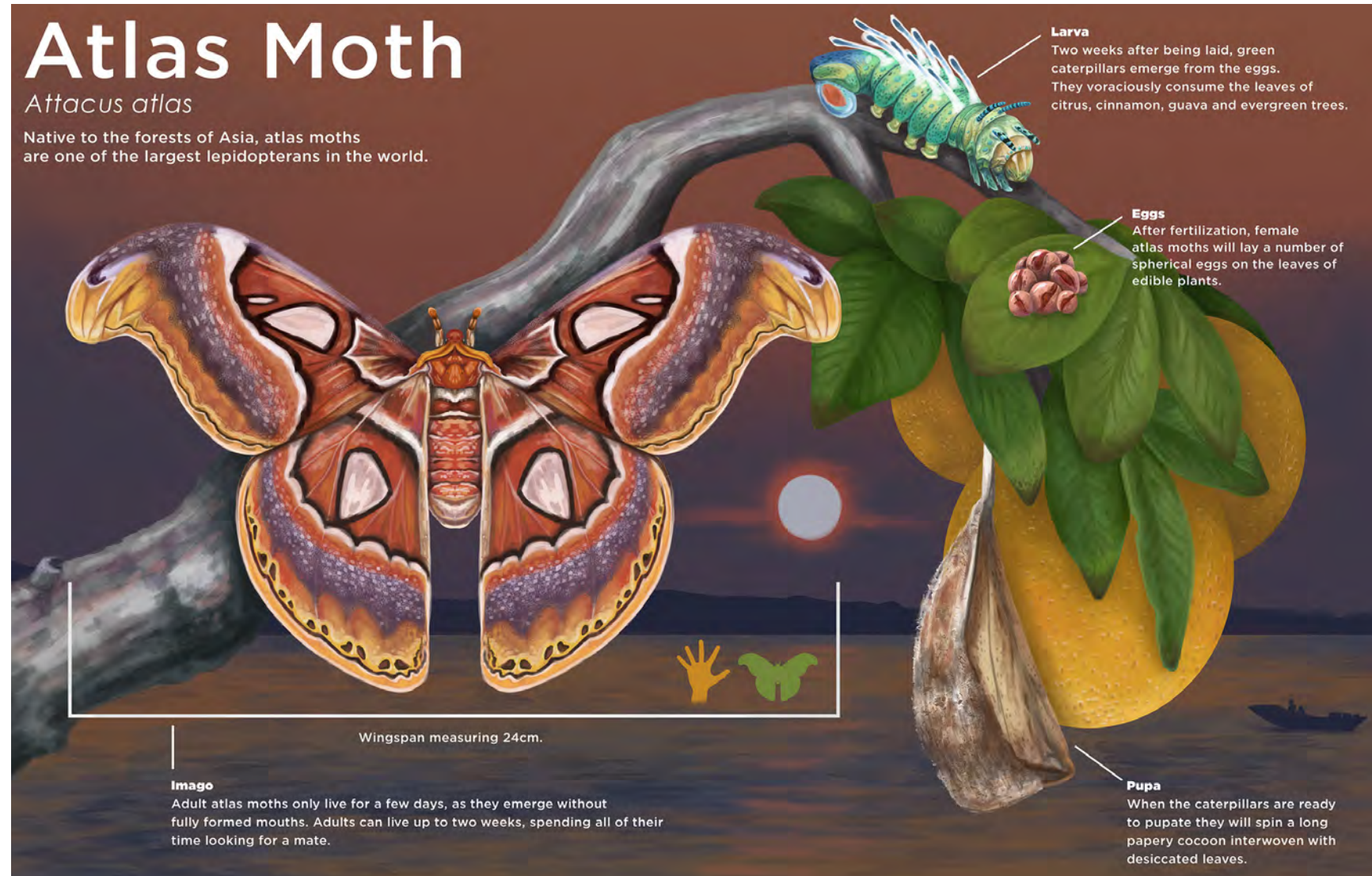
— Edward R. Tufte



Atlas Moth

Attacus atlas

Native to the forests of Asia, atlas moths are one of the largest lepidopterans in the world.



Larva
Two weeks after being laid, green caterpillars emerge from the eggs. They voraciously consume the leaves of citrus, cinnamon, guava and evergreen trees.

Eggs
After fertilization, female atlas moths will lay a number of spherical eggs on the leaves of edible plants.

Pupa
When the caterpillars are ready to pupate they will spin a long papery cocoon interwoven with desiccated leaves.

Imago
Adult atlas moths only live for a few days, as they emerge without fully formed mouths. Adults can live up to two weeks, spending all of their time looking for a mate.

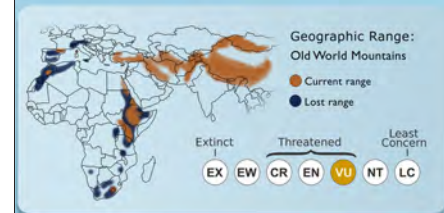
Wingspan measuring 24cm.

Atlas Moth (Attacus atlas)
Allison Mosley 2021
20" x 14" Digital Media

Bearded Vulture

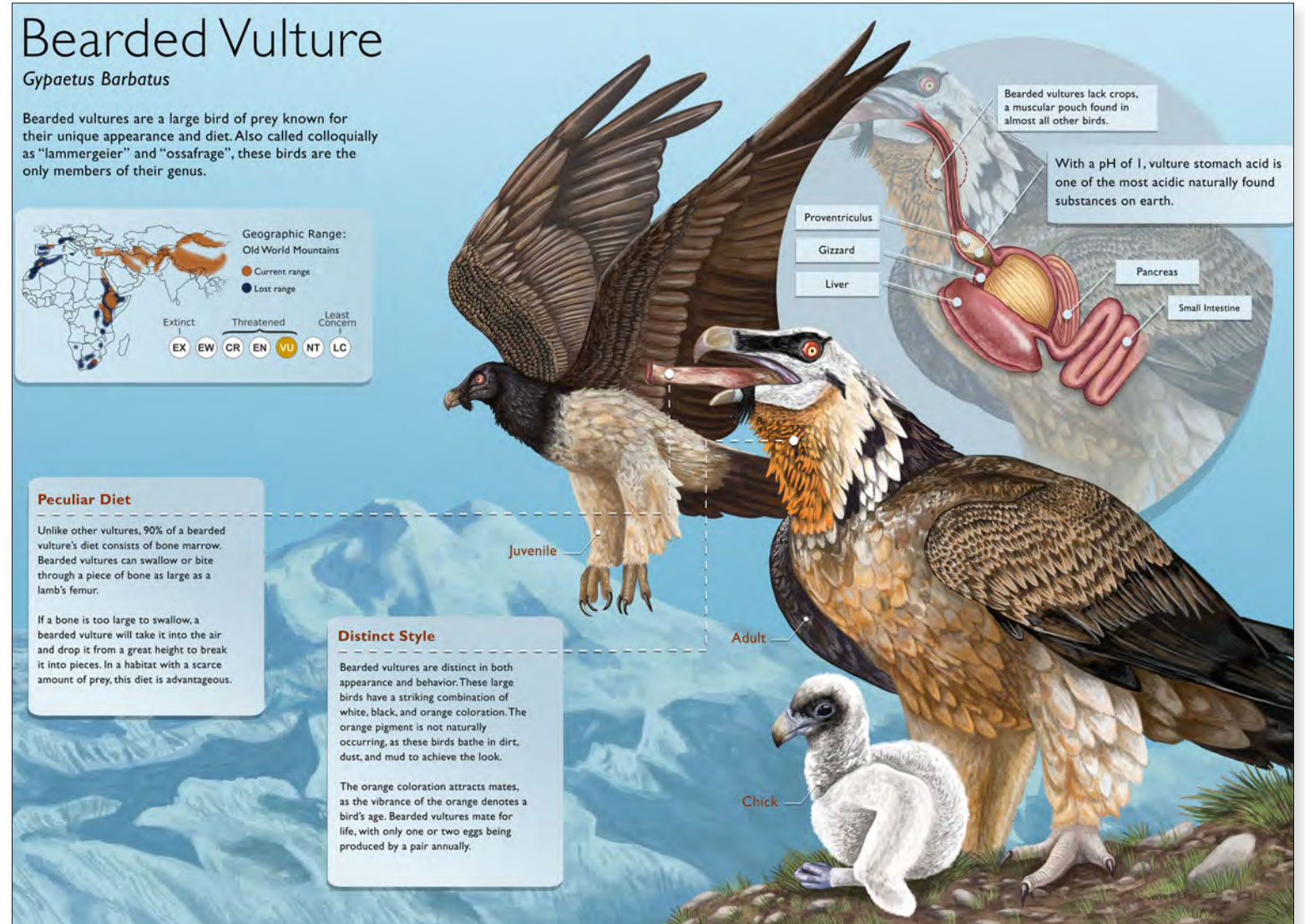
Gypaetus Barbatus

Bearded vultures are a large bird of prey known for their unique appearance and diet. Also called colloquially as "lammergeier" and "ossafrage", these birds are the only members of their genus.



Peculiar Diet
Unlike other vultures, 90% of a bearded vulture's diet consists of bone marrow. Bearded vultures can swallow or bite through a piece of bone as large as a lamb's femur.
If a bone is too large to swallow, a bearded vulture will take it into the air and drop it from a great height to break it into pieces. In a habitat with a scarce amount of prey, this diet is advantageous.

Distinct Style
Bearded vultures are distinct in both appearance and behavior. These large birds have a striking combination of white, black, and orange coloration. The orange pigment is not naturally occurring, as these birds bathe in dirt, dust, and mud to achieve the look.
The orange coloration attracts mates, as the vibrance of the orange denotes a bird's age. Bearded vultures mate for life, with only one or two eggs being produced by a pair annually.



Bearded vultures lack crops, a muscular pouch found in almost all other birds.
With a pH of 1, vulture stomach acid is one of the most acidic naturally found substances on earth.

Juvenile

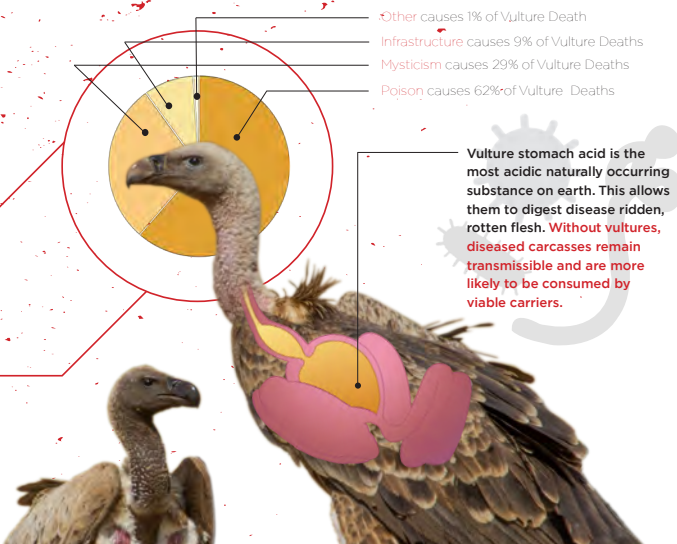
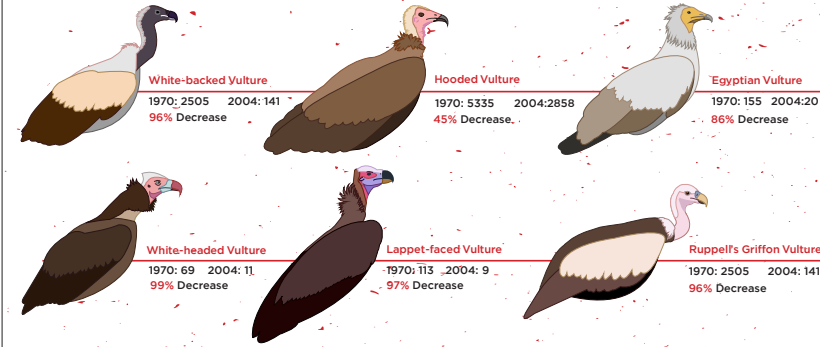
Adult

Chick

Bearded Vulture (Gypaetus barbatus)
Allison Mosley 2021
20" x 14" Digital Media

DEATH OF THE PLAGUE DOCTOR

The front lines of pandemic prevention are empty, as Africa's vultures face total population collapse.



Vultures provide essential ecosystem services, yet they are among the most threatened groups of birds worldwide. Currently, 69% of vultures and condors are listed as threatened or near threatened by the IUCN, the majority classed as endangered or critically endangered.

2010 | RVF Outbreak

South Africa

- Stands for Rift Valley fever
- Transmitted through contact with infected tissues, bodily fluid
- Causes hemorrhaging and brain swelling in some

25

2014 | Ebola Outbreak

Ghana

- Hemorrhagic virus
- Causes excessive blood clotting
- Leads to blood leaking, inflammation, and tissue damage
- Highly transmissible with a death rate of 90%

11,310

2018 | Rabies Outbreak

South Africa

- Incredibly deadly viral disease
- Attacks the central nervous system
- Symptoms range from muscle spasms, fatigue, delirium, aggression and even excessive salivation
- Death rate nearly 100%

25,000

2018 | Anthrax Outbreak

Kenya

- Infectious disease caused by Bacillus anthracis
- Transmitted through a variety of pathways including spores
- Can cause fever, respiratory distress, skin ulcers and death

8

2020 | Lassa Outbreak

Nigeria

- Viral infectious disease
- Mainly transmitted from animal urine or droppings
- Causes fevers, hemorrhaging, hearing loss, and death

5,000

2020 | Coronavirus Outbreak

Worldwide

- Highly infectious viral disease
- Caused first pandemic in nearly a century
- Causes respiratory illness
- Has killed over 2 million people

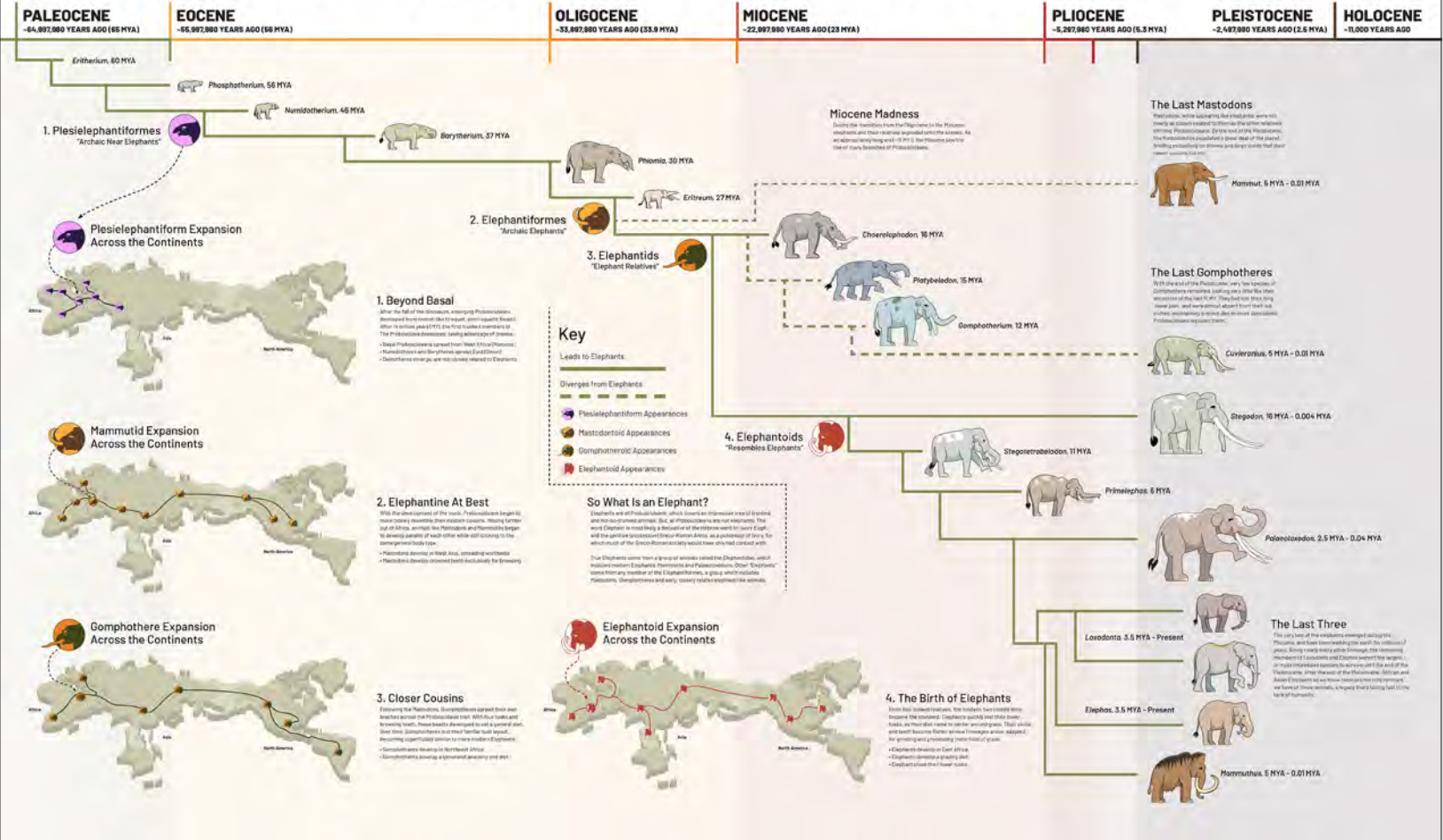
2,400,000

Over the last century, there has been an alarming increase in the number, frequency and diversity of zoonotic disease outbreaks. Caused by the spill over of pathogens from animal hosts to people, these events may have more than tripled in the last decade, with the number of new zoonotic diseases infecting people quadrupling over the same time period.



Elephant Expedition

From West to East Coast in Millions of Years (MYA)



Death of the Plague Doctor
Allison Mosley 2021
30" x 40" Digital Media

Elephant Expedition
Lucas Petrin 2020
42" x 36" Digital Media

HIMALAYAN NATURAL DISASTERS

The Effects of Climate Change



Himalayan Natural Disasters
Santiago Gomez-Vargas 2020
30" x 40" Digital Media

Poison Dart Frog

Poison dart frogs are some of the most colorful animals on Earth. These amphibians appear with yellow, blue, red, green, black, or gold coloration. Although beautiful, the patterns and hues that appear on these frogs serve a deadly purpose.

As one might imagine from the name, poison dart frogs carry toxins in their skin that (depending on the species) can easily kill a human. The frog's coloration acts as a warning against any potential predator that may be thinking about eating one as a snack.

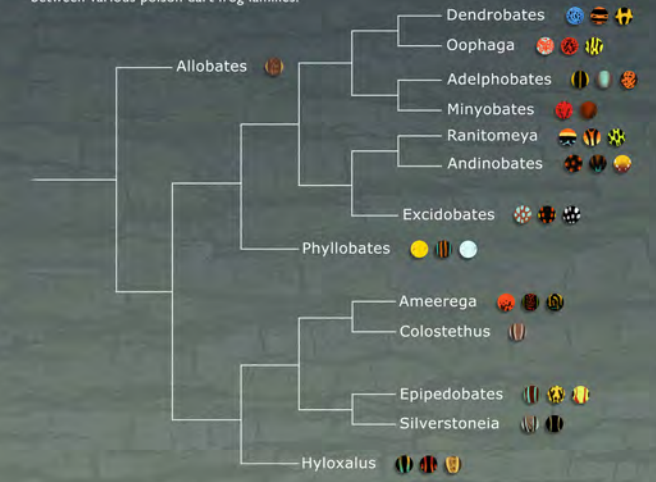


Red-Backed Poison Dart Frog
Ranitomeya reticulata



Big Family

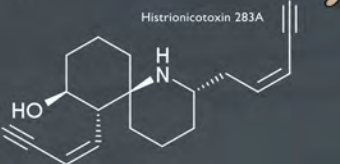
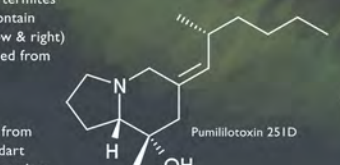
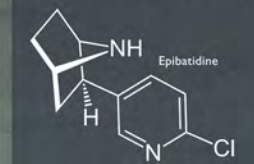
Poison dart frogs include over 100 unique species. The diagram below demonstrates examples of different pigmentation and genetic relations between various poison dart frog families.



Deadly Diet

Poison dart frogs create their poison from the food that they eat. Ants, mites, and termites found in the frog's natural habitat all contain toxic alkaloid molecules (pictured below & right). Poison dart frogs use these toxins gained from eating these insects to synthesize their own poison.

Since they rely on getting these toxins from insects in their natural habitat, poison dart frogs held in captivity will be entirely harmless. Although deadly to humans in its natural form, researchers have been able to synthesize opioid free painkillers from the dart frog's poison.



The golden poison dart frog is the deadliest of all dart frogs. A single frog has enough poison to kill 10 men.

Poison Dart Frog (Dendrobates tinctorius)
Allison Mosley 2021
20" x 14" Digital Media

Reconstruction Instruction

WHAT TO KNOW ABOUT BREAST RECONSTRUCTION

What is it?

EXPANDER-IMPLANT RECONSTRUCTION



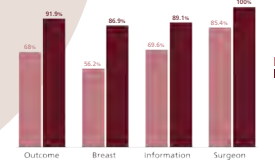
Breast reconstruction is a potential intervention to improve the body image of women with breast cancer.



ABDOMINAL FLAP RECONSTRUCTION



PATIENT SATISFACTION COMPARISON



100% of the studies in a systematic review found a direct relationship between inadequate information/communication and decisional regret.

You may not know...

Breast cancer affects women of all races.

21 months

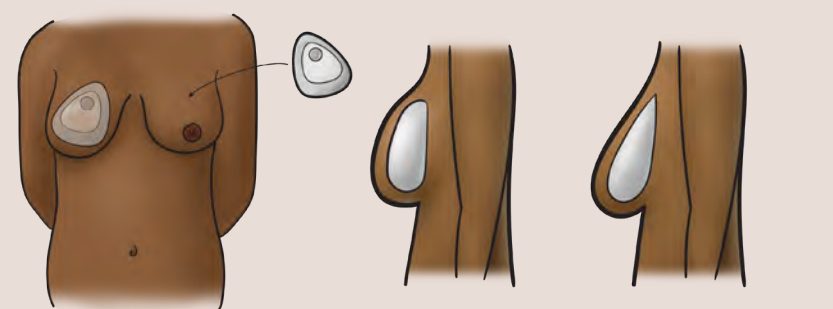
It takes about 21 months after reconstruction for a woman to feel satisfied with the appearance of her breasts.

What do I do?

Breast reconstruction can be difficult on your body, physically and mentally. Here are some tips to help you through the process.

- DO YOUR RESEARCH** - Read your research. Gather accurate information about your options.
- TALK ABOUT IT** - Consider therapy before and after your procedure.
- ALLOW FOR SUPPORT** - Use your support system to help you along.
- GIVE YOURSELF TIME** - Allow your body and mind plenty of time to hear from the changes that have occurred.
- WRITE ABOUT IT** - Consider making a journal to track your progress and thoughts.
- STAY POSITIVE** - Stay as positive as you can. Try to keep a journal of your thoughts.

EXPANDER-IMPLANT RECONSTRUCTION



- 1 Tissue expanders are placed in the breasts post mastectomy.
- 2 Expansions occur over the course of a few months.
- 3 Implants replace the tissue expanders.

Reconstruction Instruction
Jennifer McCabe 2020
46" x 32" Digital Media

made with SAFETY in mind

grew from waste cells
Virus
DNA
cell
Vaccine
Inject into muscle
Inject into muscle with chemical to boost

Here! humanity
With most people vaccinated, there is less spread among non-vaccinated people

vaccines can PROTECT us from...

Viruses
Bacterial Infections
Bacterial Toxins
Tetanus
Polio
Hepatitis A
Hepatitis B
Measles & Mumps

we need EVERYONE for it to work

85% of the population is vaccinated

2-3 M lives saved per year by vaccines

15 M deaths could've been avoided

they allow our bodies to PREPARE for future infections

Vaccine injected into the body
Immune cells
Recognizing the invader
Immune cells ATTACK!
VICTORY! Human saved from invaders

Without a vaccine
Unrecognized invaders
SURRENDER!
REPEAT! Human infected by invaders

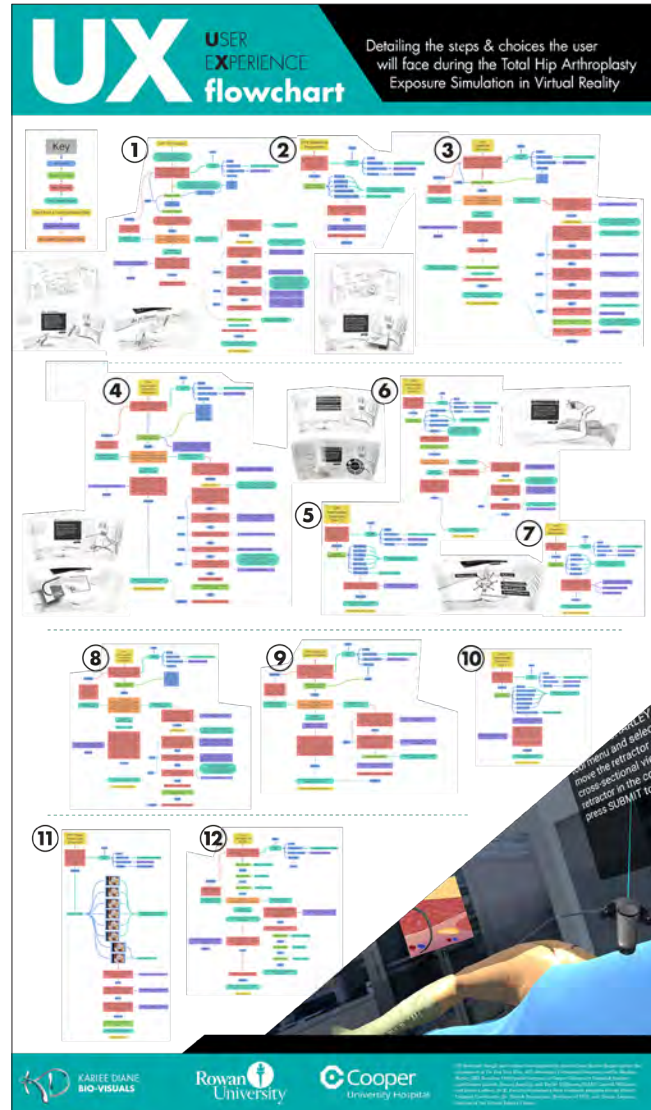
That's a Myth!

- 1 Vaccines contain harmful chemicals like Anti-freeze and Mercury!
MYTH! Phenol (which is NOT ethylene glycol or anti-freeze) is present but is not at all harmful. Also, the amount of thimerosal (a mercury-based preservative) in vaccines is less than the amount of mercury naturally found in the body!
- 2 Vaccines cause Autism!
MYTH! One poorly conducted study from 1998 claimed the MMR vaccine caused Autism. Many studies tried to replicate the results and couldn't, and even more studies show NO link between vaccines and Autism.
- 3 I don't need to get vaccinated because the infections prevented by vaccines are no longer present in my country.
MYTH! Travelers from countries that still have dangerous outbreaks can unknowingly bring diseases to the US. If you and your loved ones do not get vaccinated it puts you and others at risk.
- 4 The majority of people who get disease have been vaccinated.
TRUTH! Yes, this is true, but there is a good reason. Vaccines are 85 - 95% effective and most people in the US have been vaccinated. When the disease spreads, it will infect 100% of exposed people who have not been vaccinated and only 5 - 15% of vaccinated people. Since there are so many more people who have been vaccinated, this small percentage of the larger group still outnumbers 100% of the small group of people who have not been vaccinated. If the population stopped getting vaccines, this would no longer be true.

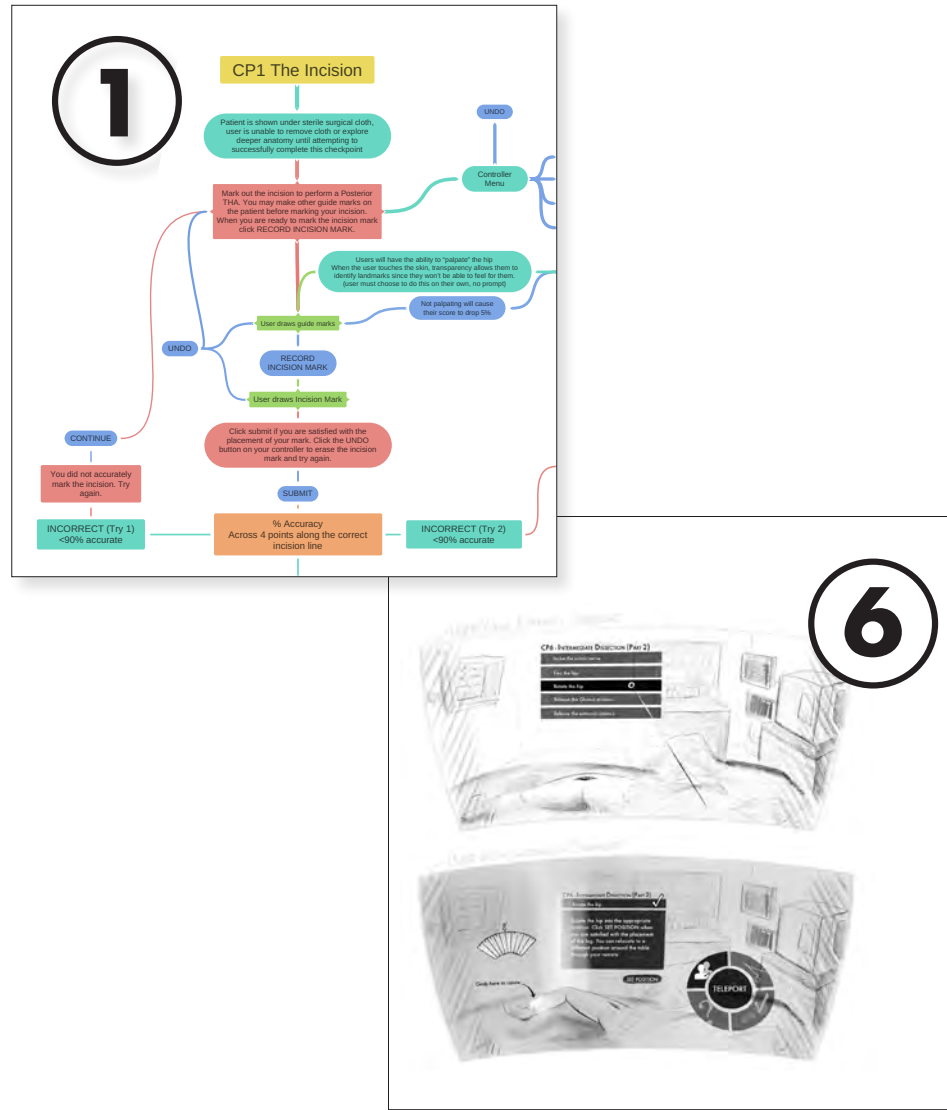
the TRUTH about VACCINES

Debunking vaccine myths while revealing the truth about how vaccines are made, how they work, and why you and your loved ones should be vaccinated!

Vaccines
Karlee D. Rogers 2020
32" x 40" Digital Media



UX Design Flowchart:
VR Total Hip Arthroplasty
 Karlee D. Rogers 2020
 60" x 36" Digital Media



THE DAWN OF MEDICAL DEVICES

Devices that paved the way for healthcare as we know today

1550 BCE
Guinea Worm Stick
 Ancient Egyptian medical text called Ebers Papyrus describes extracting the guinea worm by winding it around a stick.

1816
Stethoscope
 Rene Laennec invented the stethoscope, one of the first tools used to understand what is happening inside a live human body.

1867
Medical Thermometer
 Sir Clifford Allbutt developed the first thermometer for medical use. It took five minutes to record a patient's temperature.

1895
X-ray
 Wilhelm Roentgen's x-ray started a new era of medicine, allowing physicians to see into their patients' bodies without cutting them open.

1938
1938
 Federal Food, Drug, and Cosmetic Act (FD&C Act) results in FDA regulation of medical devices.

1940
Total Hip Replacement
 Dr. Austin T. Moore performed the first hip replacement using a cobalt-chrome alloy prosthetic joint that he designed.

1958
Pacemaker
 The first fully implantable pacemaker was invented by Dr. Ake Senning and an engineer, Rune Elmqvist, who described their invention as "a technological curiosity" and was skeptical of its practical use.

1962
Breast Augmentation
 Some of the most common complications of "first generation" breast implants were hematomas, infection, and implant hardening or "capsular contracture."

1986
Coronary Stents
 Jacques Puel and Ulrich Sigwart deployed the first stent into a patient's stenosed artery.

2000
The da Vinci Surgical Robot
 This was the first FDA approved robotic surgical system for general laparoscopic surgery. The device is controlled remotely by a trained surgeon.

2017
3D Printed Implants
 This 3D printed cervical cage was designed to mimic the structure of real bone tissue with a spongy core and hard outer shell.

2018
2018
 Trump's plan to deregulate even further "Delivering Government Solutions in the 21st Century Reform Plan and Reorganization Recommendations"

TODAY'S MARKET VALUE OF EACH DEVICE

- Guinea Worm Stick: \$1,000
- Stethoscope: \$100
- Medical Thermometer: \$1M
- X-ray: \$100
- Total Hip Replacement: \$5,000
- Pacemaker: \$1,000
- Breast Augmentation: \$10M
- Coronary Stents: \$10M
- The da Vinci Surgical Robot: \$2.15M
- 3D Printed Implants: \$1M

MEDICAL DEVICE ADVERSE EVENTS REPORTED TO FDA

- Guinea Worm Stick: 0
- Stethoscope: 0
- Medical Thermometer: 0
- X-ray: 0
- Total Hip Replacement: 0
- Pacemaker: 0
- Breast Augmentation: 0
- Coronary Stents: 0
- The da Vinci Surgical Robot: 0
- 3D Printed Implants: 0

TODAY'S TECH

Over 1.4 million people would walk away from hip replacement surgery each year. Advances in battery technology allow pacemakers to last 4-8 yrs. Leadless versions implant directly into the heart.

Amplicast is still used today in 3rd world countries, but not for long. This worm is on the verge of extinction.

Every physician learns how to listen to a patient's heart, lungs, and abdomen to detect abnormalities.

Improvements in technology have led to faster more accurate thermometers.

Most people have gotten an X-ray by the time they are 12. The X-ray lead to other imaging techniques such as CT scans, MRIs, and ultrasound.

There are hundreds of hip replacement options to meet the needs of a patient. Metal on metal prostheses were recalled after metal poisoning caused neuro-toxicity and even death.

Over 1.4 million people would walk away from hip replacement surgery each year. Advances in battery technology allow pacemakers to last 4-8 yrs. Leadless versions implant directly into the heart.

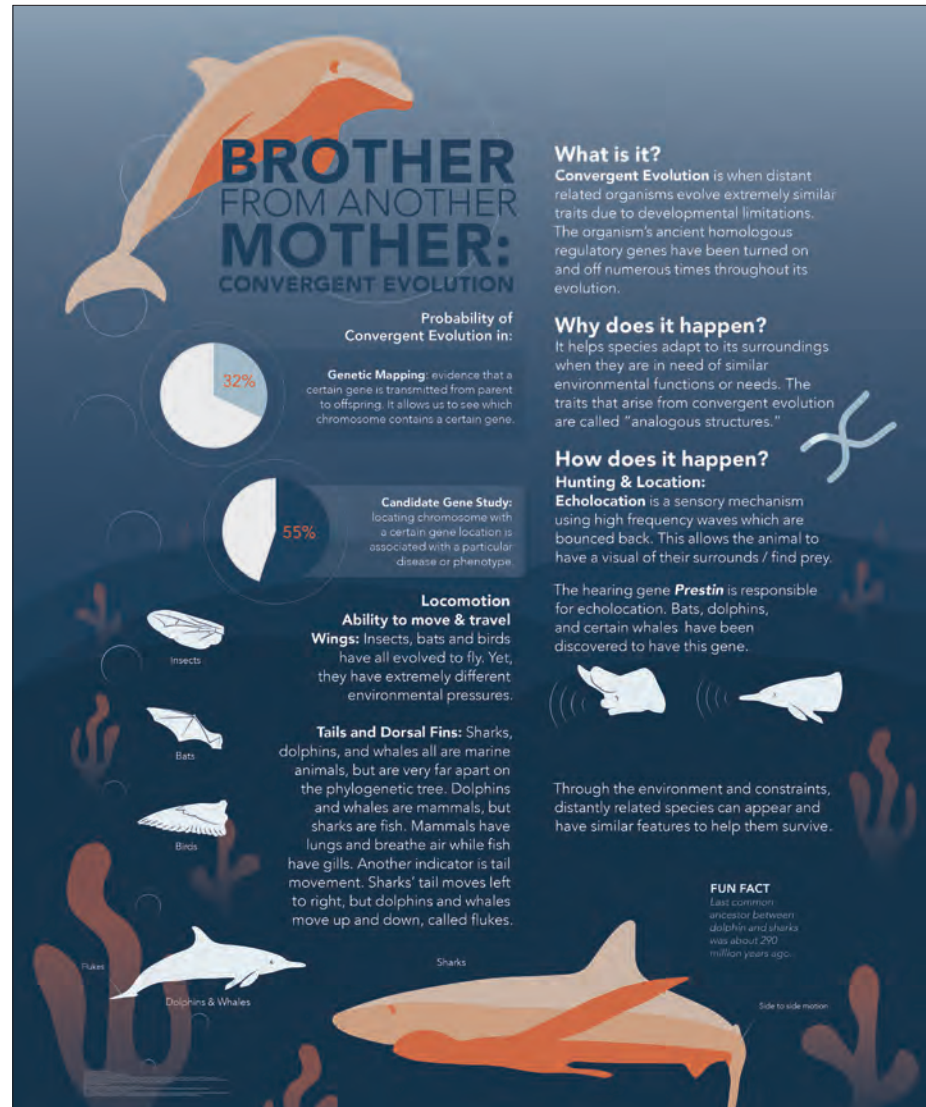
Americans spend more than \$16 billion on cosmetic plastic surgery each year. A recent study found that women with breast implants were more likely to die from brain tumors, respiratory disease, and suicide compared to other plastic surgery patients.

Extensive development in stent technology resulted in blood thinner coated stents and even self-deploying stents containing heart valves.

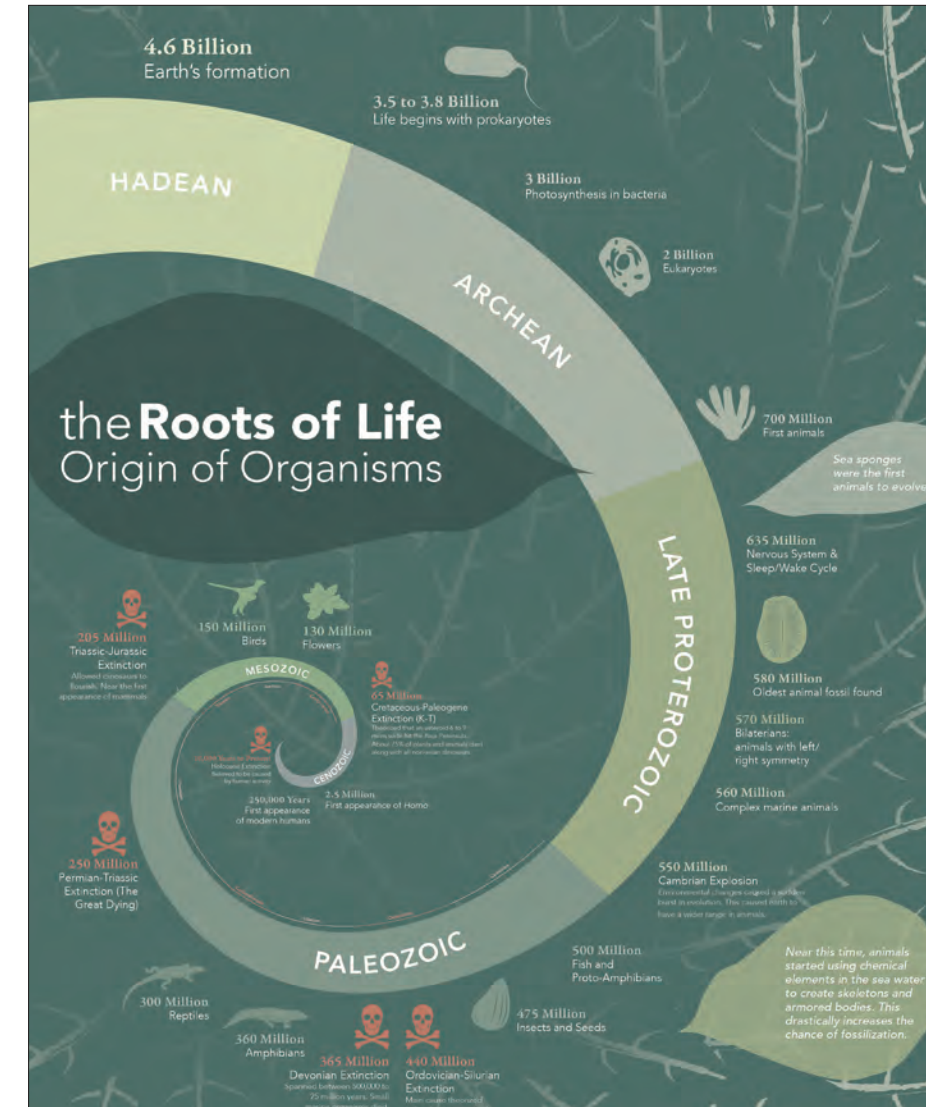
Over 1,500 U.S. hospitals have installed the da Vinci System. A 10 year study found 21,129 adverse events related to this robotic system were reported.

3D printing is gaining its place in medicine with many future advancements to come.

The Dawn of Medical Devices
 Karlee D. Rogers 2020
 32" x 40" Digital Media



Brother From Another Mother: Convergent Evolution
 Mariele Ford 2022
 45" x 55" Digital Media



Roots of life: Origin of Organisms
 Mariele Ford 2022
 42" x 60" Digital Media

Crisp, chilly, but not cold enough to bring on waves of shivers. The golden glow of morning bathed his back in warmth, a welcome embrace even as the 9 o'clock frost faded from the grass.

The mower ground to life, a familiar rev and rattle felt under the seat. Off the concrete slab and into the dewy yard, vibrant and moist greens broke the harsh crimson of the machine. With blades spinning, the whirring beast plunged into the sea before it, leaving a trail of decapitated tips as it barreled along. A bump, another, and finally a grinding halt. Something wasn't right. Beneath the now dusty exterior, the culprit was painfully obvi-

ous. A bent blade, slashed through a green fruit, no, seed. The man sighed. "Damn kids didn't pick up the walnuts again".

Walnuts are everywhere. Europe, Asia, North America, walnuts are grown worldwide as a commercial fruit. As drupes, walnuts develop as tennis-green-husked, rough oblongs. Hidden away within layers of brown shell lie their delicious tawny seeds. Though not falling year round, the chill of September and October brings them to the ground.

September wasn't as cold as it usually was. October was oddly warm. In the year of 2019, that gradual slip of the summer to autumn was as slow as gradual. It had almost felt as though the thermometer decided to flip and call it winter. While Saturday, December 21st is the official date, it would seem that in the past few years, the season had arrived early. The nuts still fell around the same time.

But where did they come from? Why are they so huge, so green? Why do they have so many shells, so many layers? Would it be believable to say that big animals were responsible for this? And would you believe it if elephants once swallowed them?

It was once much colder. Thousands of years ago, sea levels receded and the cloudy, snow heavy skies of winter fell much earlier. The last few Ice Ages of Pleistocene marked the end of an era, where global sea levels began to rise and hundreds of species of megafauna disappeared from the earth. However, the ice and animals of the left a great deal behind. In a time without metal or plastics, fresh lawns were eaten away at by herds of horses, bison and most bizarrely, elephants. Mammoths took to the fields of the Americas, creating what would

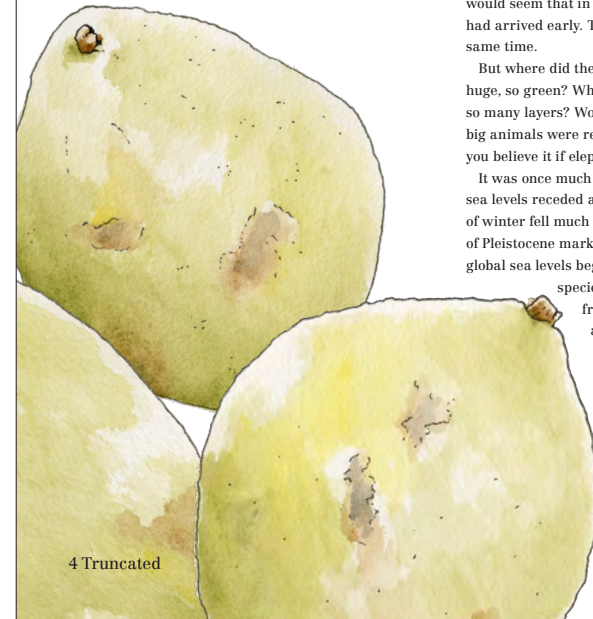
come to be known as The Great Plains. Forests on the other hand were populated by Mastodons, derived elephantimorphs specialized in browsing. Much like modern elephants, these animals were gardeners. Bushes, trees and all manner of seeds passed through any given mastodon, spreading and diversifying the very forests they ate from. So, why walnuts? As a drupe, walnuts are just one of many trees that adapted to being eaten by going big. Plants like black locusts and avocados all share very similar adaptations despite being totally different. Big seeds with big packaging. A walnut's shell hides underneath its husk. When chewed, swallowed or degraded, that shell remains. Similarly, an avocado, which happens to be a berry, is surrounded by delicious and digestible flesh. Even more bizarrely, the black locust (and relative, honey locust) leaves its seeds in huge pods! When a massive animal like a mastodon eats its way through a tree, each seed passes through its huge guts. Along the way, that seed faces digestive acids, enzymes and muscles designed to wear away at tough plant matters. Once the seed exits through the rear, it's fertilized, scattered, and ready to grow when the time is right. When more animals like mastodons were roaming the globe, these trees spread far and wide across the globe.

"Much like modern elephants, these animals were gardeners"

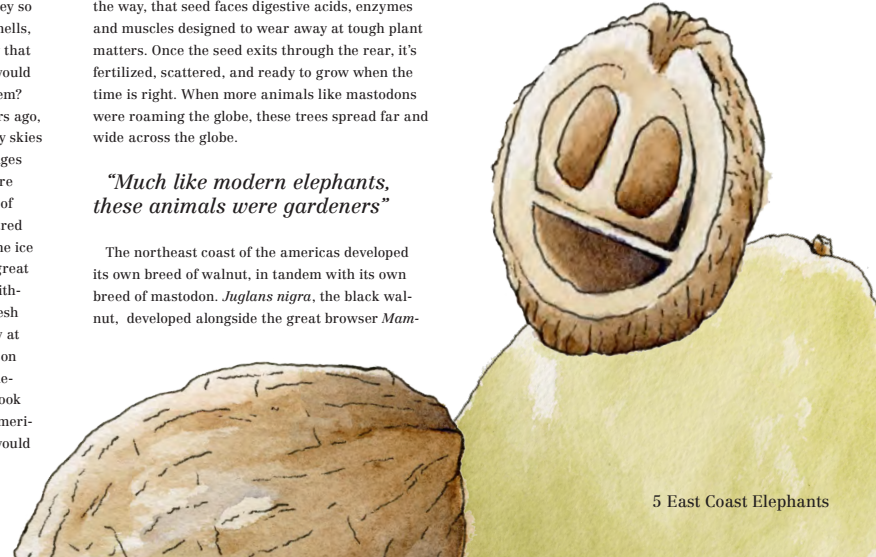
The northeast coast of the americas developed its own breed of walnut, in tandem with its own breed of mastodon. *Juglans nigra*, the black walnut, developed alongside the great browser *Mam-*

mut americanum, the american mastodon. Tougher, darker, and more round, the black walnut can be found frequently in yards, woods, and parks from Texas to Vermont. When wondering then, the range of mastodons, the two species overlap quite nicely. Further west, mastodon remains trickle. Though the west coast has its own species of mastodon, *Mammut pacificus*, this part of the americas was more dominated by the larger mammoths. Quite similarly, the California walnut (*Juglans californica*) exists in a small range. Whether this is related to a lower mastodon population is unclear. Northerly to the black walnut is the butternut (*Juglans cinerea*), a hardier, less common relative. Yet, neither of these two cousins are anywhere as populous as the black walnut. Coincidentally, these species are all only readily found where mastodons once roamed.

It would seem that where there were mastodons,



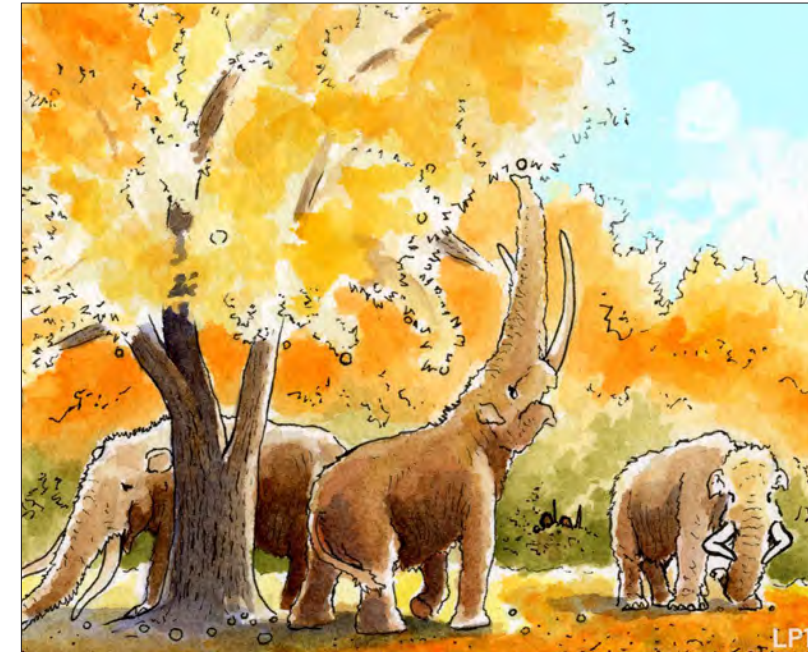
4 Truncated



5 East Coast Elephants

Truncated: East Coast Elephants

Lucas Petrin 2020
18" x 12" Digital Media



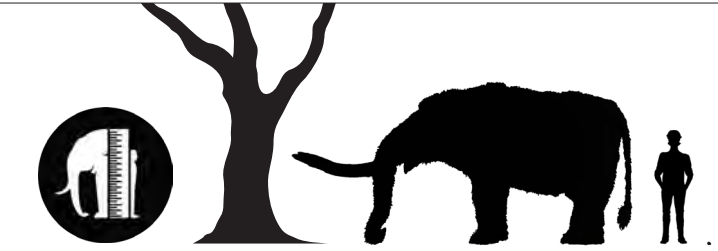
6 Truncated

there were walnuts, and vice versa. Areas full of mammoths didn't entice walnuts, as they simply aren't eating them enough. The maps show it after all. With natives walnuts stopping at the midwest, the wide open plains were full of an entirely different elephant (which actually was an elephant) with an entirely different palate. On a diet of grass, the more recent mammoth species were more like lawnmowers than their squatter cousins. Similarly, their environment was more akin to a lawn. Mammoths would likely topple trees like their modern elephant cousins, meaning any walnuts weren't particularly safe around them. While mastodons would have partaken in the same activity, their lifestyle was more than helpful in planting the

trees they knocked over.

So why are walnuts still around? Aside from being well established, walnuts are pretty competitive. This makes sense in their method of transportation, as the more walnuts, the more seeds being eaten, and the more walnuts compared to other trees. Walnuts are also delicious, so native or not, the same reason mastodons disappeared was also what kept the walnut favored and harvested. Just like the avocado, walnuts are an incredibly viable commercial enterprise, and a relic of times past. Unfortunately, mastodons didn't make the cut.

Elephants are disappearing worldwide. Every species of elephant native to North America is extinct. Every single species. There are no mammoths



remaining, no mastodons. Their cousins fared no better in Europe, and only remain in Africa and Asia. In the last 11,000 years, more than 6 species of elephants and elephant relatives disappeared from North America alone. In Africa and Asia, only three species remain. African bush and forest elephants hold strong, but are vulnerable. Less favorable, the Asian elephant is endangered. The reason is quite simple. People.

Humans have coexisted with elephants since we first left the savannahs of Africa. By that time, proboscideans had spread far and wide. From Africa to America, elephants had colonized the globe. And in a relatively short span, humans had wiped them out. Marks from mastodonts in New Mexico show marks from hunting spears. Mammoth remains worldwide were carved and constructed. Elephant populations have never truly been safe.

This means that their living relatives are in far more danger. While our paleo-neolithic ancestors would have had to rely on spear and stone, current hunters and poachers carry much more efficient means of dispatching pachyderms. A gun, after all, is far more deadly than a carved flint, no matter how sharp.



7 East Coast Elephants

"Where there were mastodons, there were walnuts"

Fifty, one hundred years from now, no matter the time really, if our current course of conservation is to judge, most of the elephants we know will be gone. Asian elephants will fall first. African forest elephants next, and the bush last. We can change this.

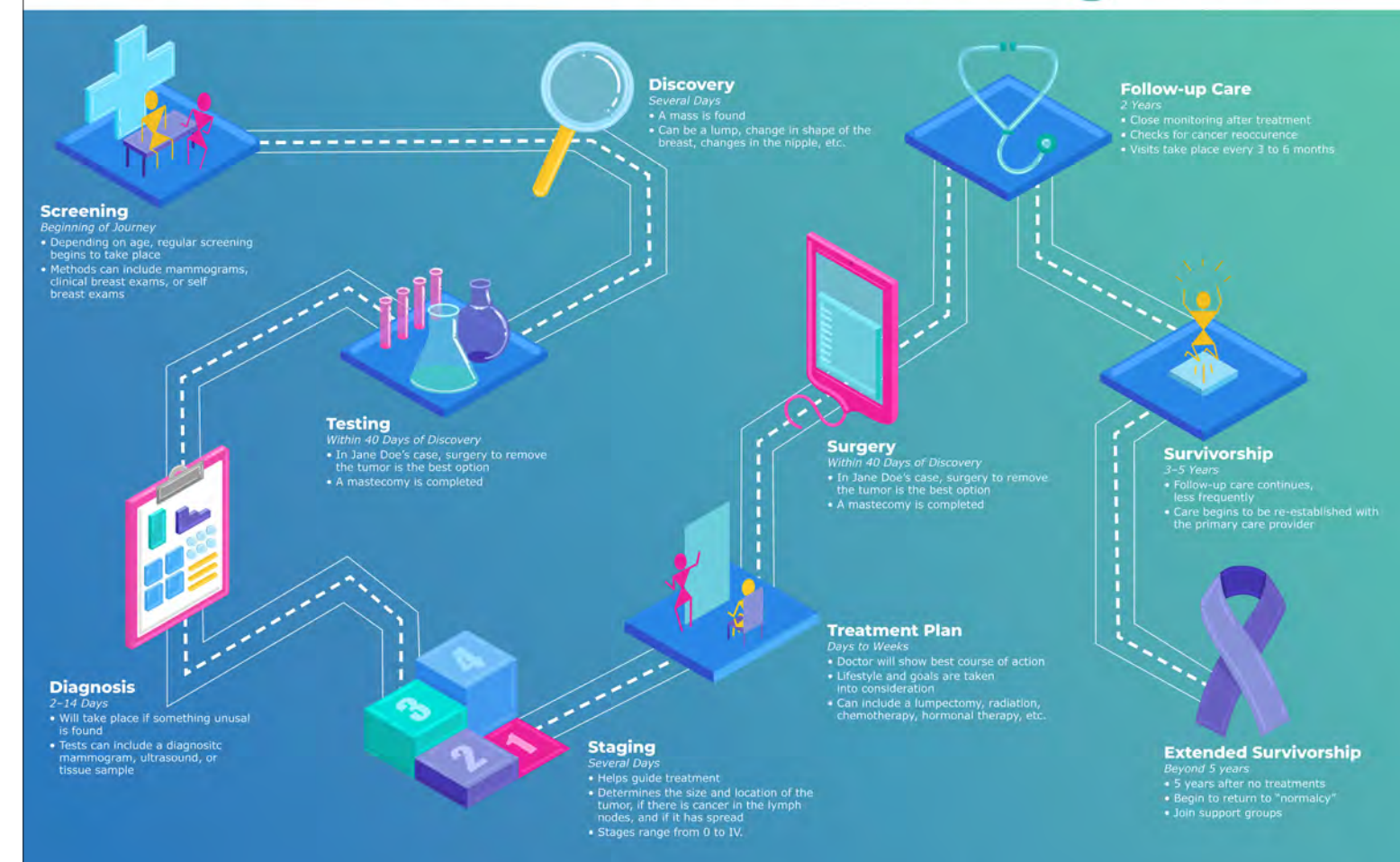
This is a message for a future without mass extinctions. This is *Truncated*.

Truncated: East Coast Elephants

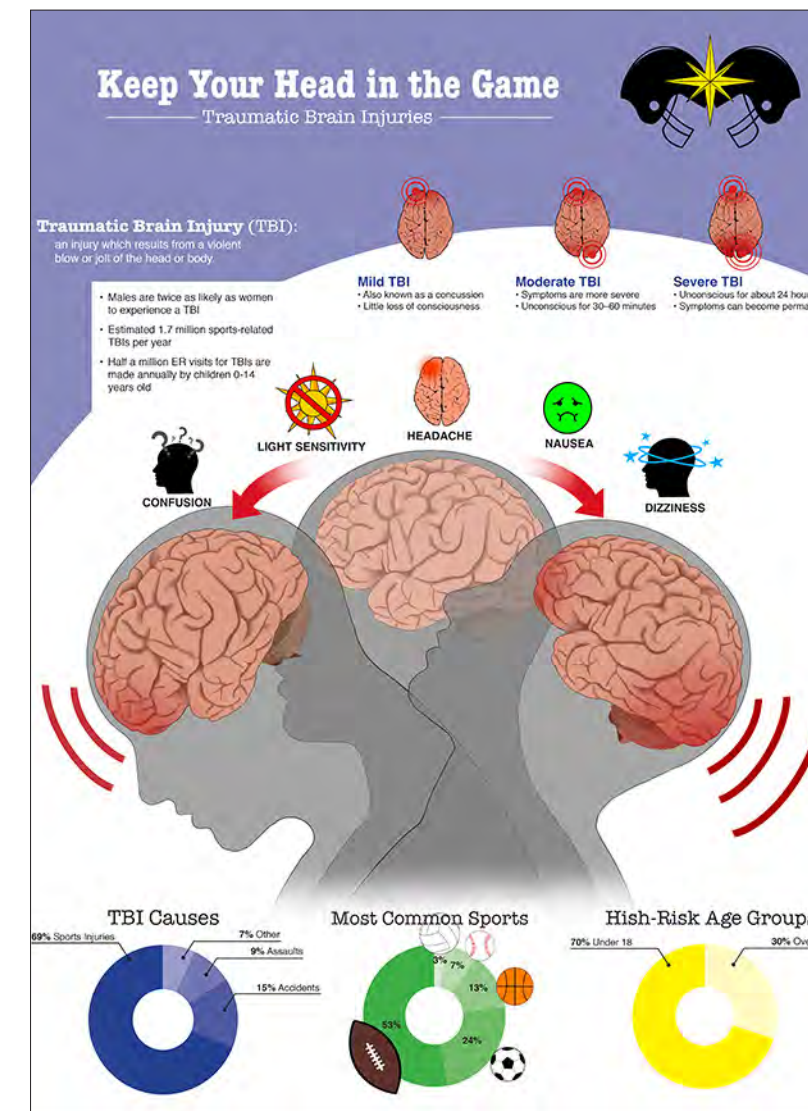
Lucas Petrin 2020
18" x 12" Digital Media

Road to Recovery

A Typical Breast Cancer Patient Journey



Road to Recovery
Jessica Angelini 2021
32" x 40" Digital Media



Keep Your Brain in the Game
Megan Miller 2020
48" x 32" Digital Media

MILESTONES IN MENSTRUATION

The history of modern period products

1920
Kleen is launched by Kimberly-Clark to use cellulose bandages leftover from World War I.

1933
Denver business woman Gertrude Sandrich purchases the rights to tampons for \$32,000.

MILESTONES IN MENSTRUATION

The history of modern period products

1956
Mary Beatrice Davidson Kanner files a patent for an adjustable sanitary napkin belt. She was later approached by a company who wanted to market her idea, but the company representatives lost interest when they found out she was black.

1975
Procter and Gamble launch a new tampon, Bely. It is marketed as a super absorbent tampon and is made entirely of synthetic materials.

2017
Bodyform is the first brand to show a pad's absorbency with red liquid instead of blue in an advertisement. This is part of their campaign Blood Normal, which aims to break taboos about periods.

E. C. HAAS
CATHETER DEVICE
Filed Nov. 10, 1951

1931
Dr. Earle Haas develops the modern tampon. The product is complete with a string for easy removal and an applicator tube. He names it "tampon" to combine the words "tampon" and "vaginal packs".

1935
Lorraine W. Chalmers invents the menstrual cup, and her patent is approved in 1937. A rubber shortage due to World War II stalls production of her invention.

1970
The first modern pads are invented. They do not require a belt; instead they have adhesive undersides that are attached directly to the user's underwears.

Welcome to the beltless, pinless, fuss-less generation!

1980
817 cases of menstruation related toxic shock syndrome are reported, and 38 of these cases are fatal.

MAY
55 cases of toxic shock are reported to the Center for Disease Control. 32 of the reported cases occurred in women. Out of the 40 women who's medical history was gathered, 38 of them were menstruating when TSS occurred.

JUNE
The CDC publishes a follow-up report which describes three studies that found an association between TSS and the use of tampons. Further studies find that the risk of TSS is greater in women who use fully absorbent tampons due to their increased absorbency.

SEPTEMBER
Procter and Gamble invents Bely from the market.

Toxic Shock Syndrome
is so rare you might forget it can happen...

Abnormal toxic and exfoliative skin peels make us recognize in popularity the increasing concern about the environment.

Clinical Case Study: Robotic Abdominal Hysterectomy with Bilateral Salpingectomy

Jennifer McCabe, BFA Biomedical Art/Visualization
Faculty Advisor: Amanda S. Almon MFA CMI

Abstract

A hysterectomy is the removal of the uterus. In some cases, the fallopian tubes and/or ovaries may be removed along with the uterus. This can be done abdominally or vaginally. In the case observed with Dr. Warshal at Cooper University Hospital, the fallopian tubes and uterus were removed abdominally, which is called a hysterectomy with a bilateral salpingectomy. The use of the DaVinci robot in this procedure allowed for greater precision, ensuring that the surgery was successful.

Introduction

The hysterectomy is the most common surgical procedure for women in the United States (1). The first laparoscopic hysterectomy was recorded in 1989, since it is minimally invasive, leaving very small scars (2). The biggest improvement, however, from an abdominal to a laparoscopic procedure is that a laparoscopic hysterectomy allows for a shorter hospital stay and a quicker return to normal activities (1). A hysterectomy can be needed for a number of reasons, including cancer of the uterus, cervix, or ovaries, uterine fibroids that cause pain and bleeding, or the uterus in the wrong position. All of these can cause a great deal of pain for the patient, which allows the need for a total or partial hysterectomy (3). In this procedure, trocars are inserted into the abdomen, allowing for the use of the DaVinci robot. Once the uterus is located, the surrounding ligaments are ligated, including the anterior and posterior separating of the broad ligaments. All ligaments are removed through the abdominal trocars. The cervix is cut and cauterized from the uterus. The fallopian tubes are grasped and ligated, leaving the ovaries still connected to the uterosacral ligament. The uterus and fallopian tubes are removed through the vagina.

Anatomical Orientation

Five incisions are made in the abdomen, about 8-12 inches apart. A camera is inserted into the center incision, and the instruments are inserted into the outer incisions.

Preoperative Directives

One of the main requirements for a patient to undergo a hysterectomy is failed attempts at medical therapy (1). It is important that a perspective patient for this surgery has exhausted all possibilities of recovery without a surgical procedure. The surgeon must also make a preoperative decision of what to remove and how to remove it. Depending on the cause, any combination of the uterus, ovaries, and/or fallopian tubes may be removed. Additionally, the surgeon must choose to take an abdominal or vaginal approach. If an abdominal approach is deemed best, then laparoscopic surgery is usually chosen as well. A pelvic ultrasound is conducted to ensure that the uterus will be able to be removed intact. The patient is put under local anesthetic.

Methods

The anterior vaginal cuff is sutured to the posterior vaginal cuff.

Postoperative Directives

Treatment is given to patients for nausea and severe abdominal pain for the first few days after the procedure. Patients are encouraged to walk around as soon as they can to stop blood clots in the legs. Patients are usually kept for a few days following the procedure, if there are no complications. About 7.2% of patients have at least one complication during a laparoscopic hysterectomy. Most of these complications are in relation to the bladder, bowels, or ureters. Some institutions are able to perform any type of hysterectomy as an outpatient procedure. This is only when immediate emergency care is available (2). They should have regular pelvic screens to ensure full and healthy recovery.

Discussion & Conclusions

The surgery that I got to see was successful. The surgeon was able to remove the uterus and fallopian tubes with no complications. The patient was expected to have a full recovery. Something that surprised me is that this surgery is usually done with two surgeons, or a surgeon and a resident, depending on the resident's level of expertise. When I observed the procedure, the leading surgeon ligated the ligaments on one side of the uterus, then the resident did the rest, until it was time for the colpotomy. It was an interesting and exciting surgery that I did not expect to be so interested in, but ended up really enjoying it.

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A HISTORY OF HYBRID ANIMALS UNNATURAL SELECTION

3000 BCE
SINAL, EGYPT
BEAST OF BURDEN
Cave paintings at Mount Sinaï suggest that mules, a cross between a female horse and male donkey, are the preferred pack animal of miners.

1766
GREAT BRITAIN, UK
CROSS-SPECIES AFFAIR
The first recorded instance of wolf and dog crossbreeding occurs in Great Britain. The union resulted in a litter of nine pups.

1798
ÉTAMPES, FRANCE
AN ODD OFFSPRING
Etienne Geoffroy Saint-Hilaire illustrates a colored plate depicting the offspring of a lion and tiger.

1809
HERTFORDSHIRE, UK
HYBRIDS ON DISPLAY
Lionel Walter Rothschild establishes the Natural History Museum at Tring. On display are multiple hybrid animals, some bred by Rothschild himself.

1899
PENCUIK, SCOTLAND
HORSE OF A DIFFERENT COLOR
James Cosser Ewart performs breeding experiments with zebras and horses dubbed "The Pencuiik Experiments." Romulus the zorse is a result of these experiments.

1959
KOLHAPUR, INDIA
NEW KING OF THE JUNGLE
The first documented breeding of a leopard and lioness occurs in India, resulting in the hybrid "leopon."

1989
VICTORIA, AUSTRALIA
DAWN OF THE DESIGNER DOG
Breeder Wally Corran creates the first labradoodle, a hypoallergenic seeing eye dog.

2008
FLORIDA, USA
ONE MASSIVE MUTT
Yuki the wolf-dog hybrid becomes a viral sensation after being rescued by the Shy Wolf Sanctuary in Florida.

2014
SOUTH CAROLINA, USA
HERCULEAN HEFT
992-pound liger Hercules is dubbed the world's largest living cat by the Guinness Book of World Records.

2019
ILLINOIS, USA
FAMOUS FELINE PAIR
Justin Belver purchases Suzi and Tuna, two juvenile Savannah cats, for \$35,000. They are introduced to the public with their own Instagram account.

Legend:
 - Intertine: cannot produce offspring
 - Fertile: can produce offspring
 - Commercial: can purchase to own / view
 - Companion: legal to own as a pet
 - *legality restricted

A History of Hybrid Animals
Taylor McKeown 2020
32" x 40" Digital Media

SURGICAL PROCESS THE DEEP INFERIOR EPIGASTRIC PERFORATOR (DIEP) FLAP

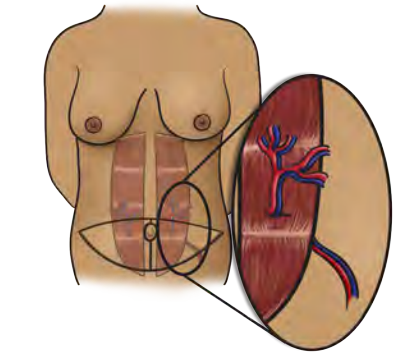
SURGEONS
Dorothy W. Bird, MD, Andrew S. Newman, MD & Steven Bonawitz, MD, Cooper University Hospital

OVERVIEW
Women who undergo a mastectomy have the option to have a DIEP flap reconstruction as well. DIEP stands for deep inferior epigastric perforator. The perforators used in this procedure are veins and arteries that run through the rectus abdominus muscle. Each DIEP flap contains one artery and one vein that will be sutured to recipient vessels under the rib. This allows the blood supply to flow through the flap once it is implanted. The DIEP flap can be smoothly implanted into the breast due to the large segment of soft tissue on this flap.

Although many women choose this procedure over implants because of the 'tummy tuck' that comes with it, the DIEP process actually differs from a tummy tuck because the rectus abdominus must be dissected in order to remove the flap with the perforators. In a regular tummy tuck, the rectus abdominus is remained intact. A small, but not significant percentage of women notice weakness in abdominal strength after the procedure. Potential patients should understand this difference before proceeding with this type of reconstruction.

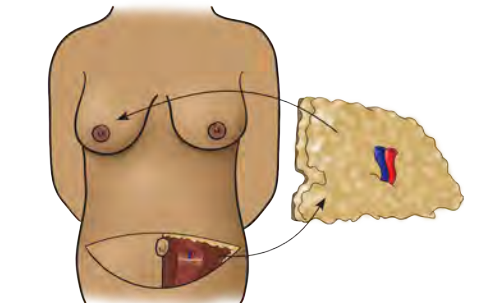
1 ORIENTATION AND INCISIONS

Perforators are marked on the skin before the procedure begins. Five incisions are made on the abdomen to outline the flap.



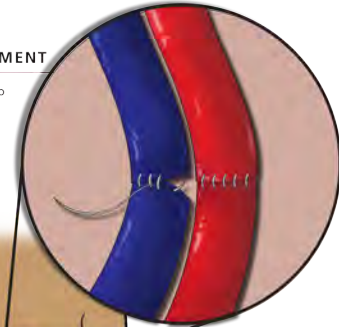
2 FLAP REMOVAL & REPLACEMENT

One flap is removed, cutting the perforators, then replaced on the opposite breast. The same is done for the other side if the procedure is bilateral.



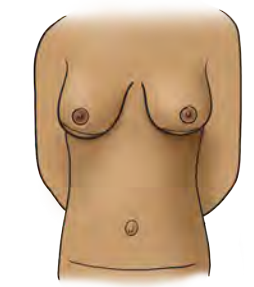
3 PERFORATOR ATTACHMENT

Perforators from the flap are sutured to a vein and artery from the breast. The same is done for the other side if the procedure is bilateral.



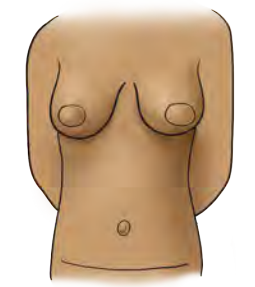
4a NIPPLE-SPARING OUTCOME

In cases where the nipples can be spared through reconstruction, the patient is left with scars below one or both breasts, along with scars around the belly button and across the lower abdomen.



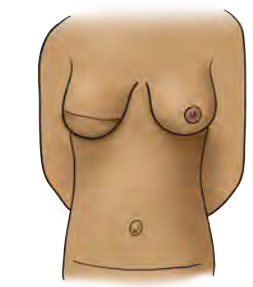
4b SKIN-SPARING OUTCOME

In cases where the nipples cannot be spared, skin from the flap is left exposed, leaving scars around the previous place of the nipples, as well as scars around the belly button and across the lower abdomen.



4c DELAYED OUTCOME

In cases where a previous reconstruction has taken place, skin from the flap is exposed under the breast, with scars across the breast, around the belly button, and across the lower abdomen.



DIEP Flap Procedure
Jennifer McCabe 2020
48" x 36" Digital Media

WHITE NOISE

Exploring the relationship between deafness and coloration

The Color Correlation
Many of the recognized forms of hereditary deafness are associated with white pigmentation

Deafness in Dogs
The prevalence of deafness in dog breeds with the recessive piebald alleles is highest for the Dalmatian

What percentage of Dalmatians are deaf?
8% bilaterally deaf, 22% unilaterally deaf

Genetic Components of Deafness in Dogs
• Recessive alleles of the piebald locus
• Dominant allele of the merle locus

PIEBALD
Having a pattern of unpigmented spots

IRISH SPOTTING
Symmetrical unpigmented markings on the muzzle, chest, and feet

EXTREME WHITE PIEBALD
Extreme lack of pigment with coloration only occurring on the muzzle/hair

What is a locus?
In genetics, a locus refers to a specific point on a chromosome where a particular gene or marker is located.

Deafness in blue-eyed white cats is the most recognized form of deafness in animals.

In cats with two white parents, the likelihood of deafness increases with increasing number of blue eyes.

80%	Blue eyes	Blue eyes
40%	Blue eyes	Yellow eyes
17%	Yellow eyes	Yellow eyes

White Noise
Taylor McKeown 2020
46" x 32" Digital Media

Listen to Nana!

HOW CLIMATE CHANGE AFFECTS YOUR BODY
Climate change, together with other natural and human-made health stressors, influences personal health in numerous ways. While some existing health threats will intensify, there will also be new ones emerging.

While not everyone is equally at risk, considerations include:

- Age
- Economic Resources
- Location

Key Climate Drivers for Health Impacts:

- Frequent and Longer-Lasting Extreme Heat
- Increasing Frequent and Extreme Weather
- Intense Storms
- Changes in Precipitation and Climate Variability

REDUCED LUNG FUNCTION
Warmer temperatures and shifting weather patterns can worsen air quality.

Poor air quality can damage lung tissue, reduce lung function, inflame airways and worsen lung conditions such as Lung Cancer and COPD (chronic obstructive pulmonary disease).

MENTAL HEALTH
Extreme weather events can affect mental health in several ways. Following natural disasters, high levels of anxiety, depression and PTSD has been observed among those affected.

CARDIOVASCULAR DISEASES
Smoke exposure, air pollution and increasing temperatures are the main factors that worsen cardiovascular diseases such as:

- Coronary Artery Disease
- Healthy Artery
- Narrowed Artery
- High Blood Pressure

INTESTINAL DISEASES
While not an increasing concern, food and waterborne Diarrheal Disease still remains a big concern. Those exposed to inadequately or untreated water are at a higher risk.

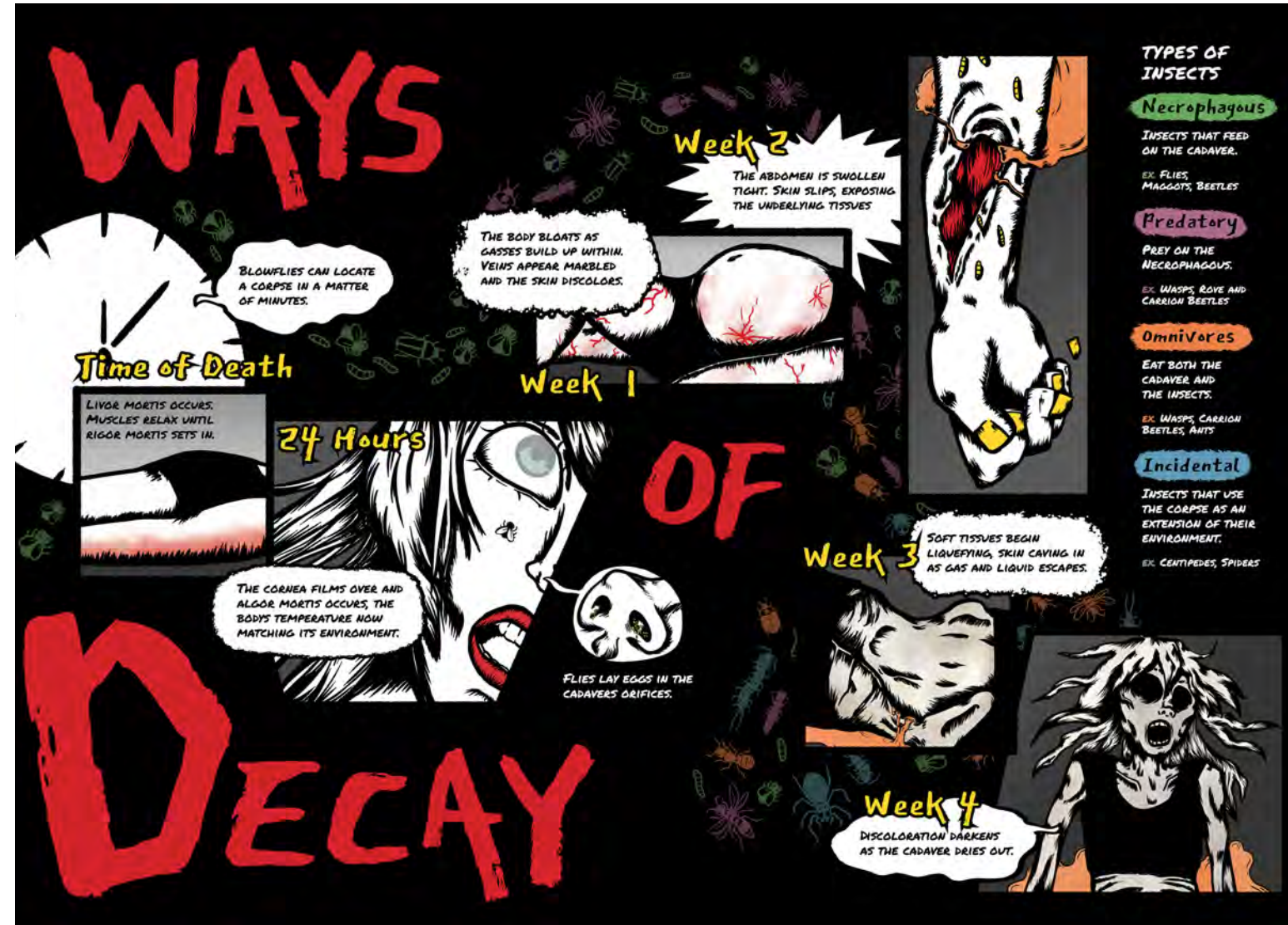
Exposure to a variety of pathogens in water and food causes Diarrheal Disease.

Symptoms	Most Vulnerable
Diarrhea	Elderly
Abdominal Pain	Children
Fever	

DISEASES CARRIED BY VECTORS
Vectors are organisms that carry/distribute ill-causing pathogens. Daily, seasonal and year-to-year climate variability results in vector adaptation and shifts in their geographical ranges. Increasing their numbers and resilience.

VECTORS	DISEASES
Fleas	Lyme Disease
Mosquitoes	Dengue Fever
Ticks	West Nile Virus
	Tularemia
	Plague
	Rocky Mountain Spotted Fever

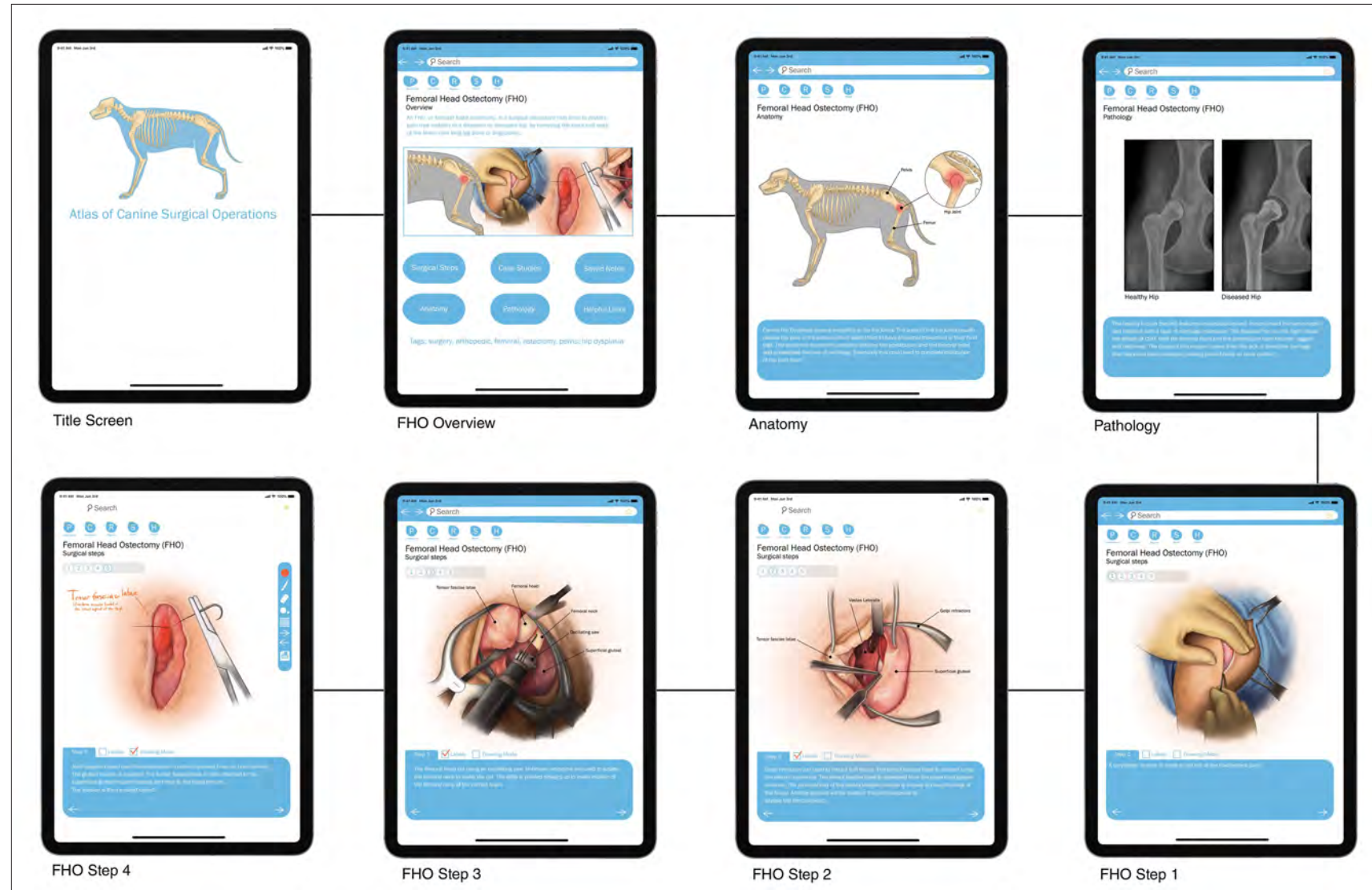
Listen to Nana
Santiago Gomez-Vargas 2020
32" x 40" Digital Media



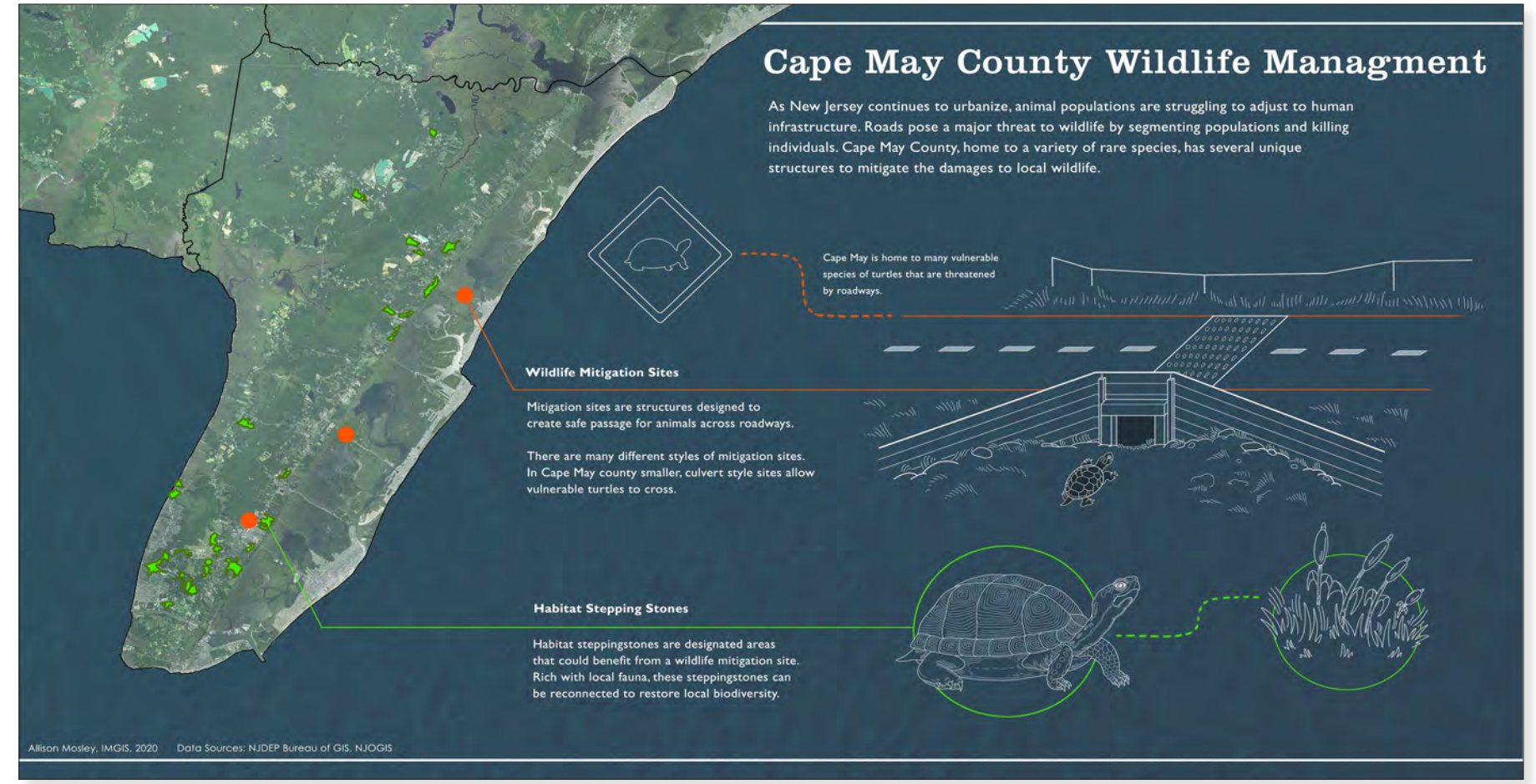
Ways of Decay
Dani Jewell 2021
32" x 40" Digital Media



LGBTQ+ Crimes Against You
Dani Jewell 2021
18" x 24" Digital Media



Atlas of Canine Surgical Operations iOS App
Allison Mosley 2021
1080 x 1920 HD Digital Media



Cape May County Wildlife Management
Allison Mosley 2021
32" x 40" Digital Media

CLINICALLY BOUND

A BRIEF HISTORY OF RACISM IN U.S. MEDICINE

The Hottentot Venus

1789-1815
Sarah Baartman

- One of at least two South African Khoikhoi women taken by European colonizers
- Displayed at freakshows for years.
- Her brain, sexual organs, and skeleton remained in a Paris museum until 1974.

Father of Modern Gynecology

1876-1880
James Marion Sims

- Named president of the American Medical Association in 1876.
- Named president of the American Gynecological Society in 1880.
- Also known for the many brutal experiments he performed on enslaved black women.

Phrenology

1810-1840
Franz Joseph Gall

- Established the concept in 1796.
- Alleged that ones skull shape and facial features can be used to determine character.
- Used to profile a wide array of individuals based on features they had no control of.

Codename HeLa

1951
Henrietta Lacks

- Originator of HeLa cells
- Described as an "immortal" human cell line
- Widely used in cancer and general medical research to this day
- The cells were taken without her knowledge or consent and neither she nor her family were ever compensated.

Bad Blood

1932-1972
Tuskegee Experiment

- "Tuskegee Study of Untreated Syphilis in the Negro Male"
- An experiment conducted by the CDC and US Public Health Service.
- Of the 600 men conscripted, 8 remained to receive an apology from president Bill Clinton in 1997.

Free, Last

1995-1996
Saquinavir

- 1995, the first protease inhibitor (Saquinavir) is approved by the US FDA.
- Used to prevent viral replication.
- 1996, HIV was no longer the leading cause of death for all Americans ages 25-44.
- Remained the leading cause of death for African Americans in this age group for years to come.

Testing Abroad

1990s
AZT (Retrovir)

- Poorly managed trials for the HIV prevention drug AZT in Zimbabwe
- Resulted in an estimated 1000 babies being born with HIV/AIDS.
- Working prevention methods already existed and were available.
- These trials were funded in part by the US.

Eugenic Value

1921-1942
Margaret Sanger

- 1921, published an article lauding Eugenics as "the most adequate... solution of racial, political and social problems."
- 1942, went on to found Planned Parenthood

DID WE EVOLVE FROM MONKEYS? NO, AND HERE'S WHY

DID WE EVOLVE FROM MONKEYS? NO, AND HERE'S WHY

34% of Americans reject human evolution.

62% of Americans accept human evolution.

11/12 known hominid species are extinct. The only extant species remaining are *homo sapiens*.

Without a clear living ancestor, perceptions of our evolution can become warped.

WHY DO PEOPLE THINK THIS? EVOLUTION CAN BE CONTROVERSIAL AND DIFFICULT TO UNDERSTAND

Our genetic history goes further back than just the development of primates. One of our most famous ancestors is **Tiktaalik**, the first fish to transition to land and the **ancestor to all terrestrial life**.

Extended Scientific Name

kingdom phylum class order suborder infraorder family genus species

animalia chordata mammalia primates haplorhini simiiformes hominidae homo sapien

WHAT IS THIS?

This is a **phylogenetic tree**, a tool used to visualize the evolution and diversification of organisms.

Although this is the tree for great apes, it is only a tiny portion of the "tree of life" that eventually leads back to the ancestor to all life on earth.

10 MILLION YA - Gorillas, Chimps

4.4 MILLION YA - First bipedal hominid

1.8 MILLION YA - First hominid to use tools

300,000 YA - Largest hominid brain size

WHAT ARE THESE DOTS?

These dots represent the last common ancestor before the diversification of new species.

Humans and Neanderthals were originally the same species, as we share the common ancestor.

Using this knowledge, one can easily determine that we did not evolve from monkeys. If we did, then monkeys would be a dot, not on a separate branch. This means:

HUMANS EVOLVED FROM A COMMON ANCESTOR

*Collaborating with scientists, physicians,
and other specialists, medical illustrators
[Biomedical Artists] transform complex
information into visual images
that have the potential to communicate
to broad audiences.*

— Association of Medical Illustrators

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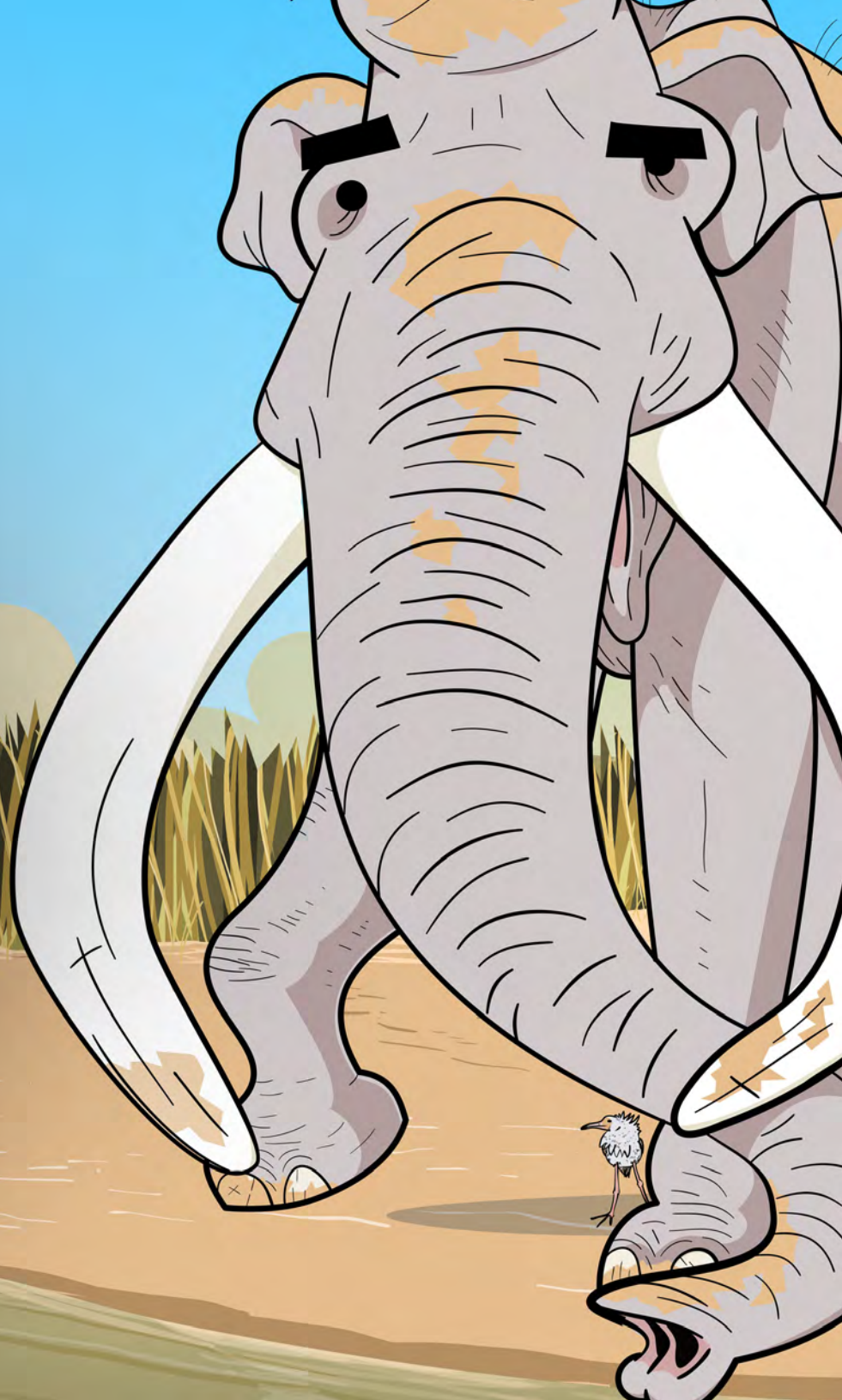
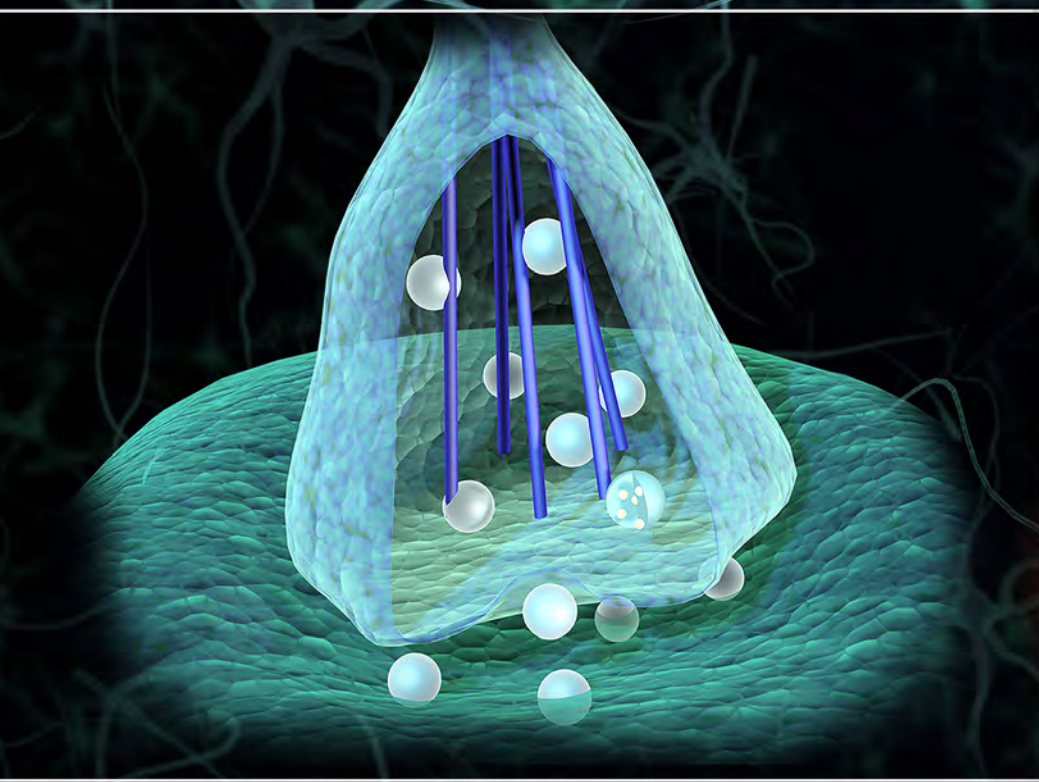
BIOMEDICAL & VISUALIZATION FACULTY

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And all the students who submitted work to the publication

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BIOMEDICAL ART
& VISUALIZATION